

APPLICATION OF BEHAVIOR CHANGE THEORY TO THE DEVELOPMENT OF AN ENHANCED CALIFORNIA NEGLIGENT OPERATOR TREATMENT AND EVALUATION SYSTEM

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PREFACE

This project is a part of the California Traffic Safety Program and was made possible through the support of the California Office of Traffic Safety, State of California, and the National Highway Traffic Safety Administration.

The goal of the project was to “develop an enhanced negligent operator treatment and evaluation system (ENOTES) based upon a critical review of the scientific literature designed to identify the treatment methods used in driver improvement studies, to estimate the strength of the scientific evidence supporting the various treatment methods, and to develop a scientifically rigorous procedure to evaluate the effectiveness of the new ENOTES program”.

The report was prepared by the Research and Development Branch of the Department of Motor Vehicles under the administrative direction of Clifford J. Helander, Chief. The opinions, findings, and conclusions expressed in this publication are those of the author and not necessarily those of the State of California or the National Highway Traffic Safety Administration.

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EXECUTIVE SUMMARY

Background

Worldwide, more than a million people die each year as a result of motor vehicle crashes and the United States contributes in excess of 41,000 annual traffic deaths to that total, in addition to approximately 2,870,000 injuries (Evans, 2002). In 2000, California experienced 3,730 deaths from 3,331 fatal collisions and 303,023 injured persons from 198,348 injury collisions. The California mileage-death-rate is 1.22 per 100,000,000 miles (SWITRS, 2000).

Young males, a population in possession of high performance capability and an even higher risk tolerance, drive these extreme levels of highway carnage. These individuals qualify for the negligent operator designation by routinely overwhelming their

performance capabilities with high-risk behaviors. The key to developing effective traffic safety interventions involves an appreciation of the distinction between performance and behavior (Evans, 1991). Traffic safety researchers are faced with an intricate problem of devising treatments for drivers who, on the basis of performance capabilities, should not need them, but on the basis of behaviors, cannot function safely without them.

In California, the Negligent Operator Treatment and Evaluation System (NOTES), established in 1985 to replace the Post Licensing Control Reporting and Evaluation System (1976-1983), was credited with the prevention of 6,000 crashes during its last four years of operation. The NOTES treatments consist of a warning letter, a notice of intent to suspend, and a probation hearing, given in sequential order as a driver accumulates negligent operator points. Overall, the program's letter treatments were effective in reducing serious crashes involving injuries and fatalities, as well as those involving only property damage. In addition, collision reduction was found to be related to the number of negligent operators treated. Finally, associations between letter treatments and citations were generally stronger than those for crashes.

With the discontinuation of the NOTES program in 1995, legislative and departmental decision makers were denied an empirical basis for assessing program effectiveness. Furthermore, it is known that the effects of treatments change over time, but there is no system in place to evaluate whether the current treatments remain effectual.

The dual foci of this literature review are driver improvement studies that utilized letter treatments, and the components of those treatments. The first reason for these specific emphases is practical, the second financial and the third theoretical. McBride and Peck (1970) addressed the first consideration when they stated that the advantages of an effective warning letter over a meeting are obvious when it is recognized that a larger number of drivers can be contacted more rapidly and easily, and it may be possible to make a letter as effective as a meeting for improving traffic safety.

Secondly, given limited financial resources, government needs to be mindful of opportunities for providing improved services at reduced costs. In this spirit, California's NOTES program has produced a large and reliable, positive traffic safety impact through a strategy of mailing inexpensive letter treatments to thousands of negligent operators. In this way, relatively small effect sizes were magnified into the statistically significant and cost-effective results reported in this review of the literature. In addition, as reported by McBride and Peck (1970), the rapid delivery of a letter intervention has the potential to prevent the need for a more costly meeting between the negligent-operator and the department.

Finally, for more than 50 years, traffic safety researchers have been studying the results associated with a variety of treatments and commenting on the elements needed to create more effective treatments. Adding credence to the accuracy of these early traffic safety researcher's intuitive recommendations, a more disciplined research agenda in transformational psychology was discovering that similar treatment elements to those identified in traffic safety formed the motivational basis of behavior change in general. Taken together, these observations form the foundation of a model for behavior change.

Why do negligent operators change hazardous driving behaviors? In California, 30,000 accidents were prevented over the past 20 years as a direct result of drivers responding positively to negligent operator treatment programs, according to research conducted by the Research and Development Branch of the Department of Motor Vehicles (Peck and Healey, 1995). While these accident reductions were associated with receiving treatment, many treated drivers also failed to modify their behaviors, while scores of untreated ones experienced encouraging transformations. The search for the components of effective, brief negligent operator treatments has continued for more than 50 years, but, as Miller (2000) states, "There is, at present, no cogent explanation for the efficacy of brief interventions."

Negligent-operator treatment systems that utilize "warning letters" are predicated upon an implicit theory that links a brief contact with a distant, governmental regulatory agency to an abrupt and profound decisional shift in driving behavior, a phenomenon Miller and C'de Baca (1994) described as a sudden transformational or quantum change.

Because behavior change is a major goal of injury prevention (Christoffel & Gallagher, 1999), a review of treatments found to be effective with highly resistant groups might assist in those efforts.

Transtheoretical Model of Change

People change. To the behavioral scientist, this knowledge sustains practice but the methods implemented to catalyze change are often too particularistic and parochial in their application to have collective appeal. Prochaska and DiClemente (1982) adopted a more universal approach by studying the steps traversed by individuals in the course of unassisted self-change efforts and, in the process, discovered an underlying, systematic process capable of predicting readiness to change. Their subsequent research confirmed that the change phenomenon progresses through the same steps with or without professional assistance (Prochaska and DiClemente, 1984).

The stages through which individuals pass in the process of changing a behavior include: **pre-contemplation**, **contemplation**, **determination**, **action**, **maintenance**, and **relapse**. Each stage describes a person's readiness to change and specifies effective strategies to motivate the individual to move toward the next stage. In this context, motivation can be defined as the probability a person will persevere in a change strategy. The stage-specific motivational tasks facing a developer of treatments for negligent operators include the following:

- **Pre-contemplation:** Raise doubt about the advisability of continuing the hazardous behaviors.
- **Contemplation:** Influence the decisional balance away from the status quo by presenting reasons to change and stressing risks associated with a decision not to change.
- **Determination:** Encourage change with suggestions regarding courses of actions that will lead to positive change.
- **Action:** Promote change by offering assistance in plan development.
- **Maintenance:** Help identify and implement strategies to prevent relapse.

- **Relapse:** Assist reentry into the change process as soon as possible.

Miller and Brown (1991) reported that brief interventions are potent agents for change because their major impact is motivational. Specifically, the authors believe these brief interventions elicit commitments from subjects to try changing their behaviors and to persevere in their efforts. Previous research has identified three types of elements useful to the change process: General elements necessary to any change strategy; Early Stage elements to promote movement through pre-contemplation, contemplation, and determination; and Late Stage elements to elicit movement through the action, maintenance, and relapse phases.

Previous research also has identified 16 elements that promote change through the Stages noted above. Six of these are General elements necessary to any behavioral change strategy, five promote Early Stage change and five are needed in the Late Stages. However, no previous research has evaluated the treatment letters used in traffic safety in terms of the 16 Transtheoretical Model (TTM) components. The results of that type of research might provide the means to develop treatment letters capable of more powerful effects in the future.

Research Methods

A total of 198 references were accumulated from journal articles and previously published literature reviews. Approximately 58 of the original articles were eliminated from further consideration due to titles that intimated unsuitable content. The remaining 140 references formed the pool of studies to be reviewed for information pertaining both to letter-style, treatment methods and to components within the letter treatments shown to be effective change agents. Of the 140 titles reviewed in the initial stage, 46 were found to contain treatments other than advisory letters. The remaining 94 studies were included in the second phase of the literature review. A total of 44 of these were traffic safety studies and the other 50 involved research articles in the fields of transformational psychology and goal attainment scaling. Approximately 70 studies were ultimately utilized, including 13 negligent operator treatment studies that evaluated 42 treatment letters.

The criteria used to evaluate the quality of the research and validity of the treatment methods evolved with a growing awareness that many of the administered treatments lacked a theoretical basis and several of the studies neither provided examples of the advisory letters sent to negligent operators nor supplied adequate descriptions of their contents. In the final analysis, the quality of the research was estimated from the descriptions of the research design contained in the reviewed studies. One point was awarded for the existence of each of the following six elements: participation rate of at least 70%; no-treatment control group; random assignment; similar subject characteristics; researcher blinded to randomization schedule; and, temporality, the evidence that treatment preceded outcome. The minimum and maximum possible points ranged from 0 to 6. These points were then multiplied by a factor of four to arrive at the final Design Quality score that ranged from 0 to 24. The factor of four was established to emphasize that the design is the most important consideration in research.

The quality of the treatment letters was determined from an assessment of the number of TTM elements used in their construction, multiplied by a factor of three for the General methods, a factor of two for the Early Stage techniques, and a factor of one for the Late Stage components. The quality scores were allowed to range between 0 and 18, 0 and 10, and 0 and 5 for the General, Early, and Late Stage elements, respectively. Therefore, 33 would represent a perfect score across all 16 TTM components. The General strategies were multiplied by three, the largest TTM factor, because the balance of the methods used in the Early and Late Stages of change will be less powerful in the absence of the General strategies. The factor of two used to multiply the Early Stage points reflects its relative importance to the General and Late Stage elements.

An evaluation sheet (Appendix A-1) was developed for the purpose of assessing each study containing advisory treatment-letters or sufficiently detailed descriptions of treatment contents. This evaluation sheet recorded the study's title, author, source, date, design characteristics scores, general strategy scores, early-stage strategy scores, late-stage strategy scores, strength of association, and other factors relevant to the evaluation. The evaluated studies were tabulated by the strength of evidence supporting each treatment in terms of the quality of the research and the validity of the methods as defined by the degree to which they reflected components of the Transtheoretical Model of behavior change that was used as the assessment instrument (Appendix A-2).

Results and Discussion

The warning letters evaluated for this critical review varied in their contents. Some incorporated more of the 16 TTM elements than others and a few contained a richer combination of elements across the three major components than most. Evidently, the number of TTM elements incorporated into a treatment letter functions as a general indication of the attention the author paid to its contents.

The McBride and Peck (1970) study is the best of the studies in terms of what these authors accomplished regarding the isolation of treatment components. However, the design quality received a score of 16 of a possible 24. There was some question about the level to which the authors were blinded to the randomization schedule since that procedure had to be adjusted to equalize the cells. Also, significant differences were found in the subject characteristics among the groups, giving rise to doubts about the integrity of the random assignment process.

The majority of the studies earned either 20 or 24 points out of a possible 24. Overall, the designs were outstanding. However, the warning letters themselves were weaker, and generally not strongly tied to a theory of behavior change. The evaluation of the treatment letters included a calculation of the percentage of letters that applied each of the TTM elements, and these are shown in the table below.

The table illustrates two major points. The first is that the Marsh studies (1985–1995) used treatment letters that incorporated fewer TTM elements than the balance of the studies reviewed. The second point is that treatment letters utilized progressively fewer elements from the later stages of the three-stage TTM model.

It is instructive to note the correspondence between the TTM elements used in the various treatment letters and those recommended in the traffic safety literature over the past half century. All of the recommended elements were represented in the treatments evaluated, but of the five that were not recommended, self-reevaluation was used in only 10 percent of the cases and the other four, social liberation, stimulus control, counter conditioning, and self liberation were not used in any treatment letter. A summary is provided below.

Percent of Treatment Letters Using Each TTM Element

Elements		All 42 letters	24 Marsh letters (1985-1995)	18 other letters
General stage	Systematic feedback	42 / 42 (100%)	24 / 24 (100%)	18 / 18 (100%)
	Personal responsibility	15 / 42 (36%)	4 / 24 (17%)	11 / 18 (61%)
	Direct advice	17 / 42 (41%)	11 / 24 (46%)	6 / 18 (33%)
	Choice of strategy	6 / 42 (14%)	0 / 24 (0%)	6 / 18 (33%)
	Express empathy	14 / 42 (33%)	7 / 24 (29%)	7 / 18 (39%)
	Strengthen self efficacy	18 / 42 (43%)	8 / 24 (33%)	10 / 18 (56%)
Early stage	Consciousness raising	41 / 42 (98%)	24 / 24 (100%)	17 / 18 (94%)
	Dramatic relief	25 / 42 (60%)	12 / 24 (50%)	13 / 18 (72%)
	Environmental reevaluation	12 / 42 (29%)	6 / 24 (25%)	6 / 18 (33%)
	Social liberation	0 / 42 (0%)	0 / 24 (0%)	0 / 18 (0%)
	Self reevaluation	4 / 42 (10%)	4 / 24 (17%)	0 / 18 (0%)
Late stage	Stimulus control	0 / 42 (0%)	0 / 24 (0%)	0 / 18 (0%)
	Helping relationships	8 / 42 (19%)	3 / 24 (13%)	5 / 18 (28%)
	Counter conditioning	0 / 42 (0%)	0 / 24 (0%)	0 / 18 (0%)
	Contingency management	4 / 42 (10%)	0 / 24 (0%)	4 / 18 (22%)
	Self liberation	0 / 42 (0%)	0 / 24 (0%)	0 / 18 (0%)
Total		206 / 672 (31%)	103 / 384 (27%)	103 / 288 (36%)

General Stage Elements

One important General Stage strategy is to provide feedback to the person who is targeted for change. All of the letters examined provided this feedback by including information about crashes and convictions on the person's driving record. Technically, this category should have been scored based upon systematic feedback, instead of a one-shot notification. However, any reference to the driver's record was determined to be sufficient to satisfy this element.

It was surprising to find that only 41 percent of the letters provided direct advice to the drivers regarding the state's expectations. Although many warning letters provided ample doses of sarcasm and less than subtle threat, more than half failed to provide direct advice about expectations.

About 43 percent of the letters communicated confidence in the ability of the driver to change dangerous behaviors, one-third expressed empathy for the negligent operator, 36 percent mentioned the negligent driver's personal responsibility to change driving behaviors that threaten the public safety, and finally, a mere 14 percent of the warning letters offered a choice of change strategies, even though that is a powerful technique used to motivate any individual contemplating change.

Early Stage Elements

Regarding the Early Stage elements, nearly all the warning letters (98%) provided information regarding the nature and risk of unsafe driving behaviors as a means to raise the negligent operators consciousness. More than half, 60 percent, of the letters provided the element of dramatic relief in which the negligent operator's emotions were consciously elevated before offering assurance that the situation was in the control of the driver. Environmental reevaluation was utilized in 29 percent of the treatments through various methods intended to allow the driver to reflect upon the possible consequences of negligent driving behaviors on innocent others. Self-reevaluation was attempted in 10 percent of the interventions and the early stage element of social liberation was ignored, totally.

Late Stage Elements

The five Late Stage behavioral elements were the most infrequently used of the sixteen methods available in the TTM. Nineteen percent offered help to the negligent operator and ten percent attempted to apply contingency management techniques. Unfortunately, the other three elements, stimulus control, counter conditioning, and self-liberation, were not used at all.

Conclusions

Fifty years of traffic safety research have established the efficacy and efficiency of exploiting the power of language to regulate the behaviors of negligent drivers (Campbell, 1959; Kaestner, et al., 1965; McBride & Peck, 1970; Epperson & Harano, 1975; and, Jones, 1997).

A review of the literature exposed a rich history of ideas traffic safety professionals have expressed to improve the effectiveness of warning letters. McBride and Peck (1970) advocated systematic feedback, intimacy, empathy and contingency management to

enhance the contents of warning letters. Li (1980) recommended the inclusion of a statement reinforcing the importance of personal responsibility, and also noted the need to raise the consciousness of negligent drivers. Carpenter and Peck (1980) offered choice in their probation by mail study. Ayers (1980) concurred with the need to express empathy as a means to motivate the drivers to accept the message contained in the warning letter. Kaestner et al. (1965) thought it was important to make an attempt to strengthen the driver's sense of self-efficacy. Epperson and Harano (1975) recognized the necessity of providing information regarding the nature and risk of unsafe driving behaviors. And, Campbell (1959) recommended the use of contingency management.

Warning letters are not new; Michigan, for instance, has been issuing them since 1940 (Hayes, 1969). What has been missing is a theory or model of behavior change that incorporates the observations of past traffic safety professionals with current knowledge generated from studies conducted within the field of transformational psychology.

The Transtheoretical Model of change (Prochaska and DiClemente, 1982, 1984) satisfies these requirements and, in addition, provides results from a research agenda that has steadfastly evaluated the effectiveness of the theory's elements. Over the past half-century, traffic safety researchers independently identified 11 of the 16 General, Early, and Late Stage strategies as important components to be included in advisory letters. These 16 TTM elements provided a standard basis for evaluating the quality of the warning letters reviewed for this report.

The TTM is a theory of change that incorporates most of the recommendations that traffic safety researchers have been recommending over a period of 50 years. While the TTM was developed independent of the traffic safety field, it addresses issues that are common to traffic safety. In addition, it has been used extensively and has been successfully validated with recalcitrant populations to address problems once thought to be immutable, such as alcohol and drug abuse.

The results of this literature review suggest that the Transtheoretical Model of behavior change can be creatively used to guide the development of improved negligent operator letter treatments that will be cost-effective, and that will improve traffic safety. The following recommendations are offered.

1. A negligent operator treatment and evaluation system, with an enhanced component designed to conduct ongoing research into the effective elements of treatment letters, should be reinstituted to provide regular program and cost effectiveness data to the Department's decision makers. The enhanced component should be guided both by the TTM and the research results emanating from that model.
2. A no-contact control condition should be approved so that true experimental research can be conducted. Smaller control groups and/or allowing one additional point to accumulate before drivers are removed from the no-contact condition should be considered as means to address the concerns of management.

3. A survey of negligent operators should be conducted in order to determine the stage of change occupied by drivers in the first three levels of the NOTES program. In the past, drivers at levels one and two received either a standard or alcohol treatment level. However, according to TTM theory, all change makers pass through the same stages, meaning one appropriately worded letter should appeal to both, equally. The more relevant issue is the stage of change the driver occupies at the time the treatment letter is received.
4. A study should be initiated to determine if a driver's stage of change at the time of assignment to treatment can be predicted from information contained on the driver's record.
5. A pilot study should be authorized to compare the subsequent convictions and crashes of negligent operators receiving the regular probation hearing or an alternative probation-by-mail sanction based upon the TTM. As early as 1970, McBride and Peck recognized that the rapid delivery of an effective letter intervention could prevent the need for a more costly meeting between the negligent-operator and the department.
6. A treatment letter should be issued when the driver receives one negligent operator point in order to address the transitory issue (McBride & Peck, 1970), which acknowledges the fact that most accidents involve previously accident-free drivers. This treatment would be based upon the TTM and directed toward accident prevention.
7. The Department should maintain an archive of negligent operator treatment letters together with information detailing changes to the letters, times of the changes, and dates the letters were retired or replaced. Without this information, it is impossible to determine which treatments or treatment elements accounted for the results found.
8. R&D should be consulted before Departmental changes are made to the contents and distribution of advisory letters when the effects of those letters are being evaluated.

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INTRODUCTION

Worldwide, more than a million people die each year as a result of motor vehicle crashes and the United States contributes in excess of 41,000 annual traffic deaths to that total, in addition to approximately 2,870,000 injuries (Evans, 2002). In 2000, California experienced 3,730 deaths from 3,331 fatal collisions and 303,023 injured persons from 198,348 injury collisions. The California mileage-death-rate is 1.22 per 100,000,000 miles (SWITRS, 2000).

Young males, a population in possession of high performance capability and an even higher risk tolerance, drive the extreme levels of highway carnage. These individuals qualify for the negligent operator designation by routinely overwhelming their performance capabilities with high-risk behaviors. The key to developing effective traffic safety interventions involves an appreciation of the distinction between performance and behavior (Evans, 1991). Traffic safety researchers are faced with an intricate problem of devising treatments for drivers who, on the basis of performance capabilities, should not need them, but on the basis of behaviors, cannot function safely without them.

Existing System

The NOTES program, successor to the *Post Licensing Control Reporting and Evaluation System (PLCRES)* established in 1976, commenced in 1983 and was recognized as the model for similar programs throughout the United States. During the final four years of the NOTES program, it was credited with the prevention of 1,500 crashes per year, or a total of 6,000 for the period. Overall, the program's treatments were effective in reducing serious crashes involving injuries and fatalities, as well as those involving only property damage. In addition, the reduction in the number of collisions was found to be linked to the number of negligent operators treated. However, differences in mean crash data between controls and treated drivers associated with the letter treatments at the first and second levels of the NOTES program often were not large enough to reject the null hypothesis of "no difference". The reported "directional" and "suggestive" results did not reach significance and chance could not be ruled out as the causative factor for the mean differences identified. Results were much stronger for associations between letter treatments and convictions. Letters at both the first and second levels of the NOTES program were found to be effective treatments with the second level letter routinely producing more positive results.

In May of 1995, California's *Negligent Operator Treatment and Evaluation System (NOTES)* was officially discontinued with the publication of *Program Effectiveness Report # 7: Summary of Findings* (Marsh & Healey, 1995). The NOTES program had provided Department of Motor Vehicles' decision makers with biennial cost effectiveness analyses and recommendations for program improvements based upon the weight of scientific evidence supporting the use of specific treatments.

California's present *Negligent Operator Treatment System (NOTS)* treats qualified drivers but the results are not evaluated. The multilevel NOTS program is activated by the accumulation of points recorded against a driver's record. Points are assessed when the driver is found to be "at fault" in an accident or is convicted of various moving

violations. A driver is classified as a negligent driver when four, six, or eight points are levied within a 12-, 24-, or 36-month period, respectively. The first level of intervention, a warning letter, was mailed to a total of 267,315 California drivers in 2001. That same year, an additional 63,884 drivers received a second level treatment letter, *Notice of Intent to Suspend*, when they reached a point count equal to one fewer than the prima facie definition of negligent operator. Finally, 44,086 Californians were notified that they had reached the prima facie definition of negligent operator, thereby invoking an automatic suspension of their driving privilege. However, the suspension was often reduced to a probation period when the driver requested a hearing with the Department to explain extenuating circumstances relating to their driving records. If the driver accumulates subsequent countable convictions while under negligent operator probation, the Department will take a suspension action.

With the discontinuation of the NOTES program in 1995, legislative and departmental decision makers were denied an empirical basis for assessing program effectiveness. Furthermore, it is known that the effects of treatments change over time, but there is no system in place to evaluate whether the current treatments remain effectual.

Overview of Current Study

The goal of this literature review is to study the relationships between the theory and practice of constructing treatment letters for the purpose of identifying components likely to improve their effectiveness with high-risk drivers.

Specifically, treatment letter components recommended in the traffic safety literature were compared with the elements of a theoretical model of behavior change. Then, the contents of a sample of warning letters were evaluated against these elements in an attempt to identify the frequency with which each appeared in the sample. The first reason for these specific emphases is practical, the second financial and the third theoretical. McBride and Peck (1970) addressed the first consideration when they stated that the advantages of an effective warning letter over a meeting are obvious when it is recognized that a larger number of drivers can be contacted more rapidly and easily, and it may be possible to make a letter as effective as a meeting for improving traffic safety.

Secondly, given limited financial resources, government needs to be mindful of opportunities for providing improved services at reduced costs. In this spirit, California's NOTES program has produced a large and reliable, positive traffic safety impact through a strategy of mailing inexpensive letter treatments to thousands of negligent operators. In this way, relatively small effect sizes were magnified into the statistically significant and cost-effective results reported in this review of the literature. In addition, as reported by McBride and Peck (1970), the rapid delivery of a letter intervention has the potential to prevent the need for a more costly meeting between the negligent-operator and the department.

Finally, for more than 50 years, traffic safety researchers have been studying the results associated with a variety of treatments and commenting on the elements needed to create more effective treatments. Adding credence to the accuracy of these early traffic safety researcher's intuitive recommendations, a more disciplined research agenda in

transformational psychology was discovering that similar treatment elements to those identified in traffic safety formed the motivational basis of behavior change, in general. Taken together, these observations form the foundation of a model for behavior change in high-risk drivers.

Brief History of the Analysis of Treatment Components in Traffic Safety

Miller (1993) asked, “Is there that-without-which change does not occur, something necessary, even if not sufficient? Are the conditions for change sufficient, even if not necessary, or both necessary and sufficient?”

Answers to those and similar questions could be explicative, forming the kernel of an idea that, when expanded, would give rise to a theory of behavior change. California has a rich history of traffic safety research, but the insights gained into the motivations that drivers use to improve on-road behaviors have not been analyzed in the systematic fashion needed to identify elements of such a theory.

Why do negligent operators change hazardous driving behaviors? In California, 30,000 accidents were prevented over the past 20 years as a direct result of drivers responding positively to negligent operator treatment programs, according to research conducted by the Research and Development Branch of the Department of Motor Vehicles (Peck and Healey, 1995). While these accident reductions were associated with receiving treatments, many treated drivers also failed to modify their behaviors, while scores of untreated ones experienced encouraging transformations. The search for the components of effective, brief negligent operator treatments has continued for more than 50 years, but, as Miller (2000) states, “There is, at present, no cogent explanation for the efficacy of brief interventions”.

Treatments can be complex, involving multifaceted dimensions that can go unnoticed in a cursory review of research studies. A more analytic approach is needed to expose the range and magnitude of treatment essentials covered by traffic safety researchers over time. For present purposes, studies into negligent operator treatments were reviewed to determine which letter treatment dimensions were addressed: foundational issues, intensity, duration, driver/DMV interactions, setting, content, and/or outcome. Interestingly, traffic safety researchers have addressed each of these components over the decades. A sampling of their observations includes:

- Foundations:
 - McBride (1967) and McBride and Peck (1970) used communications theory to guide the development of their treatments.
 - Marcil et al. (2001) demonstrated the advantage theory-based treatment development has over other approaches in traffic-safety research. In their study to identify the motivational factors underlying the intention to drink and drive in young drivers, 115 males aged 18-24 were asked to complete a questionnaire based upon the Theory of Reasoned Action (Ajzen & Fishbein, 1980). The results showed that although the group had negative attitudes toward drinking and driving, they perceived themselves as possessing sufficient behavioral control to handle the driving task after drinking. Because this study was based upon a theory of “reasoned action” whose components had been validated previously

through research, the authors simply had to design the study in a way that permitted the subjects to tell them which elements of the theory contributed to their decisions to drink and drive. That information, in turn, provided the key to designing an intervention. The researchers' concluded that reducing the "perceived behavioral control" of young drivers to a more realistic level could be a promising new approach to intervention.

- "Greater eventual progress in driver improvement might be realized if there were greater application of theoretical models in the planning and implementation of rehabilitation programs" (Kaestner, 1968).
- Intensity:
 - Levels of threat and intimacy in the treatment were manipulated by Kaestner and Warmoth (1968) and McBride and Peck (1970).
- Duration:
 - Marsh and Healey (1995) noted that short, written treatments result in short-term effects. Level 1 warning letter treatment effects did not extend beyond 6 months while Level 3 probation-hearing effects lasted as long as 9-10 months.
 - Many of the NOTES reports between 1985 and 1994 reported the same phenomenon.
- Driver/DMV Interaction:
 - An early critic of advisory letter content, Campbell (1958) felt that the bureaucratic tenor conveyed via warning and advisory letters demonstrated a philosophic bias toward punishment and retribution rather than an interest in changing drivers' behaviors, ensuring that official contacts with negligent operators would be at least punishing, if not effective.
 - McBride and Peck (1970) reported that their message based upon communications theory was largely constrained by administrative policy.
 - Warren (1981) examined the differences between traffic safety laws and the majority of other laws. While most laws punish willful acts that cause damage, traffic safety laws punish behaviors that may or may not result in unintended damage. In fact, in absolute terms (per driving infraction), it is clear to the driver that the punishment is for engaging in a behavior that is extremely unlikely to result in damage of any kind. Warren stressed the point that virtually no driver violates traffic laws with the intention of killing or maiming someone. Yet, the Department treats them as though that were their intention. He concluded that as the State persists in punishing persons for non-existent motives, behaviors would develop that could be highly resistant to change. In addition, as few of the punishments have been shown to reduce collisions, it could be assumed that the target driving groups have concluded that the motivation of the State is one of punishment rather than collision reduction. "The damage done to individuals by society (fines, jail sentences, restricted privileges) must at some point be offset by the damage prevention (injuries, deaths) to ensure continued public support." Warren's comments are reminders that the effectiveness of any treatment letter will be affected by the driver's perceptions of the Department's motivations.

- Setting:
 - Treatments by mail have produced small effects on crashes but the cost-effectiveness of using the mail permits the treatment of large numbers of negligent operators, thereby preventing many accidents each year (McBride & Peck, 1970).
 - Jones (1997) found that driver improvement warning letters are effective under some but not all circumstances. He concluded that warning letters, especially his soft-sell letter, are generally effective for drivers 35 and older but not for those 25 and under. For the younger group, doing nothing netted significantly better results than either the standard or “soft-sell” letter.
- Content:
 - Campbell (1959) reported the possibility that one type of negligent-operator treatment letter might be distinctly better than another. He concluded these “advisory” letters should be studied further by systematic experimentation in order to improve their contents and determine the best time to send the letters. Unfortunately, he did not discuss the specific domain elements required to enhance treatment effectiveness.
 - In his 1973 literature review, Goldstein stated that a well-constructed warning letter could be an effective deterrent but concluded that the content of existing forms of warning letters needed improvement.
 - “Relatively few possible varieties of content dimensions and types of appeals have been explored and the concept of tailoring content to the characteristics of specific population sub-groups has barely been touched upon” (Epperson & Harano, 1975).
 - Pennsylvania viewed deficient decision skills, not poor driving skills, as the primary cause of unsafe behaviors (Staplin, 1993). Therefore, a cognitive-behavioral approach was deemed most appropriate to address these internal attributions. Rather than teaching driving skills, Pennsylvania taught negligent drivers that their traffic violations were the result of their own choices. The intervention was dominated with written material that reinforced the ideas of individual choice and personal responsibility.
 - Much of the research into warning letter content is now 20 to 30 years older than when Goldstein raised his concern and may reflect values and attitudes irrelevant to large segments of contemporary drivers (Jones, 1997).
- Outcome:
 - Marsh (1969) questioned the value of treatment letters’ contribution to reductions in traffic violations and convictions in the absence of reductions in crashes.
 - Other researchers also have acknowledged the generally disappointing power of warning letter treatments to reduce the incidence of crashes (Jones, 1997; Marsh, 1988, 1987, 1986, Wooton, et al., 1981; Carpenter, et al., 1980).

While decades of work have been completed to evaluate the impact of letters on traffic safety, much of it stands in isolation with little attempt to synthesize it and link it to treatment. The effectiveness of advisory-letter treatments almost certainly would have progressed beyond its contemporary development if an hypothesis of change had been forged from the successes and failures of the past into a testable theory. There is ample evidence to support the contention that many negligent drivers do change various

hazardous driving behaviors after amazingly short, written treatments. The question is why? That answer might lead to treatments effective with the most critical traffic safety issue: crashes.

Quantum Change

Negligent-operator treatment systems that utilize “warning letters” are predicated upon an implicit theory that links a brief contact with a distant, governmental regulatory agency to an abrupt and profound decisional shift in driving behavior, a phenomenon Miller and C’de Baca (1994) described as a sudden transformational or quantum change.

Quantum change is fundamentally different from personal, gradual growth attributable to traditional learning or maturation (James, 1902; Premack, 1970) and may require acceptance of a second kind of learning (Hunt & Matarazzo, 1970). While behavioral scientists have been captivated but perplexed by the quantum changes observed in patients, the Transtheoretical Model (TTM) presented in 1982 (Prochaska & DiClemente) allowed the systematic, experimental study of the phenomenon. Miller and Rollnick (1991) incorporated the TTM into their work and brought the concept of quantum change to a broader audience with the publication of their book, *Motivational Interviewing: Preparing People to Change Addictive Behavior*.

Because behavior change is a major goal of injury prevention (Christoffel & Gallagher, 1999), a review of treatments found to be effective with highly resistant groups might assist in those efforts.

Transtheoretical Model of Change

People change. To the behavioral scientist, this knowledge sustains practice but the methods implemented to catalyze change are often too particularistic and parochial in their application to have collective appeal. Prochaska and DiClemente (1982) adopted a more universal approach by studying the steps traversed by individuals in the course of unassisted self-change efforts and, in the process, discovered an underlying, systematic process capable of predicting readiness to change. Their subsequent research confirmed that the change phenomenon progresses through the same steps with or without professional assistance (Prochaska & DiClemente, 1984).

The stages through which individuals pass in the process of changing a behavior include: pre-contemplation, contemplation, determination, action, maintenance, and relapse. Each stage describes a person’s readiness to change and specifies effective strategies to motivate the individual to move toward the next stage. In this context, motivation can be defined as the probability a person will persevere in a change strategy. The stage-specific motivational tasks facing a developer of treatments for negligent operators include the following:

- **Pre-contemplation:** Raise doubt about the advisability of continuing the hazardous behaviors.

- **Contemplation:** Influence the decisional balance away from the status quo by presenting reasons to change and stressing risks associated with a decision not to change.
- **Determination:** Encourage change with suggestions regarding courses of actions that will lead to positive change.
- **Action:** Promote change by offering assistance in plan development.
- **Maintenance:** Help identify and implement strategies to prevent relapse.
- **Relapse:** Assist reentry into the change process as soon as possible.

Miller and Brown (1991) reported that brief interventions are potent agents for change because their major impact is motivational. Specifically, the authors believe these brief interventions elicit commitments from the subjects to try changing their behaviors and a conviction to persevere. Previous research has identified three types of elements useful to the change process: general elements necessary to any change strategy; early stage elements to promote movement through pre-contemplation, contemplation, and determination; and late stage elements to elicit movement through the action, maintenance, and relapse phases.

Both general and specific conditions are necessary to maximize a person's motivation to change hazardous behaviors. Traffic safety researchers also identified these conditions as important to changing the driving behaviors of negligent operators (Appendix A-3). Unfortunately, in traffic safety, the conditions were not pulled together into a coherent theory of change. The general conditions Prochaska and DiClemente (1982) considered common to any effective, brief intervention, together with relevant comments from the traffic safety literature, follow:

- *Supplying systematic feedback:* Provide clear knowledge of the present situation for change to occur.
 - The letters should include a summary of previous convictions (McBride, 1981).
 - Drivers can be confronted with feedback about their driving or provided with direct advice in an empathic manner (McBride & Peck, 1970).
- *Stressing personal responsibility:* This can be stated implicitly or explicitly but the message is the same, "If change is to occur, you are the one who has to do it".
 - The content of the treatment letters should stress the driver's responsibility for improving their driving (Li, 1980).
- *Providing direct advice:* Clear advice has been shown to be very effective with behaviors that are resistant to change. In some cases, providing specific goals has been successful but, in others, the opposite is true. There appears to be personality differences at work in the way specific goals are tolerated.
 - Drivers can be confronted with feedback about their driving or provided with direct advice in an empathic manner (McBride & Peck, 1970).
- *Offering choice of strategies:* Makes use of the knowledge that intrinsic motivation is enhanced by the perception that the negligent operator has freely chosen a course of action.

- Providing a choice among options has the effect of enhancing perceived personal choice and control thereby increasing the probability that the person will persist and succeed (Kopel & Arkowitz, 1975).
- Under probation by mail, the letter offers choice to accept probation or attend an individual hearing (Carpenter & Peck, 1980).
- *Expressing empathy:* Communicates respect for the driver as a person. The letter is a blend of support and consultation.
 - Empathy has been found to be a potent determinant of client motivation and change (Chafetz, 1961).
 - Drivers can be confronted with feedback about their driving or provided with direct advice in an empathic manner (McBride & Peck, 1970).
- *Strengthening self-efficacy:* The goal is to persuade the person that he or she can make a successful change in the problem area (Bandura, 1977). If a person is persuaded of a serious and threatening condition, but perceives no way in which change is feasible, the result is likely to be defensiveness rather than behavior change.
 - In general, the soft sell letter emphasizing encouragement showed the largest reductions in violations and collisions, although just personalizing the standard letter improved its effectiveness (Kaestner et al., 1965).
 - The Behavior Analysis program used a more nondirective approach encouraging class participation and stimulating its own formulation of answers to traffic safety (Ayers, 1980).

These six building blocks for constructing motivational interventions have been shown to be effective in relatively brief spans of counseling (Miller & Rollnick, 1991). While each of these conditions could be expressed in a treatment letter, their effectiveness in that form has not been researched adequately. However, Marsh (1992) emphasized the importance of finding effective warning letter treatments. He reported that the economy of mailing a letter to negligent operators made it feasible to mail them to a very large number of drivers. For instance, 413,000 warning letters and 119,000 notices of intent to suspend were mailed in 1992. These volumes, even with small effect sizes, produced a large traffic safety impact in a cost-effect manner.

The early stages of change, those involving pre-contemplation, contemplation, and determination, are dominated by ambivalence, a state of mind in which the negligent-operator has coexisting but conflicting thoughts about driving behaviors (Miller & Rollnick, 1991). The goal of these early stages should be to tip the driver's decisional-balance away from the status quo toward a determination to try a change strategy. The following techniques have been found to be effective in the process of tipping the decisional-balance away from the status quo.

- *Consciousness raising:* Drivers in the pre-contemplation stage are not even thinking about changing their driving behaviors. They deny having poor driving habits and may even blame other drivers or law enforcement for their violations. Providing information that raises a concern about their hazardous driving habits will engender doubt about their complacency.

- Inclusion of an informational pamphlet along with driver improvement letters improved effectiveness of the mailing (Epperson & Harano, 1975).
- Warning letters should consider the possibility of incorporating some safety information (Li, 1980).
- *Dramatic relief*: The treatment should foster the identification, experiencing, and expression of emotions related to the risk and the safer alternatives as a means of promoting change. The treatment then must lower the elevated emotions with a reminder that the risk is within the control of the driver. If the treatment leaves the negligent-operator in a heightened state of arousal, a feeling of helplessness may give rise to resentment and recalcitrance toward authority.
 - Kaestner and Speight (1975) found that leaving negligent operators in a state of threat and fear arousal may trigger resistance.
- *Environmental reevaluation*: The treatment should assist the driver to reflect upon the consequences of his or her behavior for other people. The driver should be left with doubt about the opinions of those who reinforce the negligent-operator's current driving practices.
 - The content of the letters should stress the consequences of negligent driving such as endangering self and others (Lee, 1981).
- *Social liberation*: The treatment should help the negligent-operator to understand that the social norms are changing in the direction of supporting responsible driving with the goal of increased traffic safety.
 - No reference
- *Self-reevaluation*: Doubt causes a "cognitive dissonance" between behavior and self-image. The treatment should view dissonance as an opportunity to prompt the driver to align the self-image with responsible driving behaviors.
 - No reference

These early-stage techniques primarily apply cognitive methods both in an effort to raise doubt about current hazardous driving habits and in an attempt to shift the decisional balance toward changing their driving behaviors.

Some behavioral techniques also are appropriate to changing inappropriate behaviors. However, their strength lies in the positive nature of the contingencies attendant to the demonstration of the desired behaviors. In other words, these techniques would be predicted to work best in the later-stage transitions after the negligent-driver has made a determined commitment to change and has implemented a "plan." The following techniques have been found to be effective in the process of maintaining new behaviors and supporting renewed efforts after relapsing into previous, inappropriate habits.

- *Stimulus control*: The treatment should provide information about techniques to become and remain aware of the cues or reminders to engage in the hazardous behavior in order to use them as motivators to act responsibly.
 - No reference

- *Helping relationships*: Promotes seeking and using social support for the healthy behavioral change.
 - Kaestner and Speight (1975) emphasized the need for the DMV to provide assistance to drivers receiving warning letters.
- *Counter conditioning*: Substitutes healthier alternative behaviors and cognitions for the unhealthy behavior. Interventions that decrease the perceived attractiveness and increase the salience and immediacy of negative consequences of a behavior should in theory increase motivation for change (Miller, 1985).
 - No reference
- *Contingency management*: The treatment should increase the rewards for positive behavioral change and decrease the rewards for hazardous behaviors. Unfortunately, contingency management techniques have been found to be counterproductive when applied to individuals who are actually in the early stages of change, rather than the later stages. The implication of this observation is that these techniques should not be utilized without knowledge of the stage-of-change the negligent-operator occupies.
 - Further research should be directed toward developing new reinforcement strategies (McBride & Peck, 1970).
 - Also worth study is the ideal of a follow-up letter that is, in effect, a commendation (Campbell, 1959).
 - These results suggest that initial letter contacts that use an incentive strategy may be a more effective approaches than traditional warning letter programs (Epperson & Harano, 1975).
- *Self-liberation*: Helps the individual to realize that the behavioral change is an important part of one's identity as a person.
 - No reference

Transtheoretical Model and Traffic Safety

California's negligent-operator treatment and evaluation system (NOTES) was dismantled in November 1994 after the Department of Motor Vehicles terminated the use of untreated control groups, thereby eliminating the ability to conduct rigorous experimental research (Marsh & Healey, 1995). The Department of Motor Vehicles' researchers felt that under this policy NOTES quality would be compromised to such an unacceptable extent that research results could become unreliable.

The magnitude of this concern is demonstrated by the observation that the 30,000 crashes prevented in California between 1976 and 1995 as a direct result of the Post Licensing Control Reporting and Evaluation System and its successor, the Negligent Operator Treatment and Evaluation System, would have been impossible to quantify if experimental research had been prohibited during that period.

Unlike experimental designs, in quasi-experimental research, the researcher does not control the assignment of subjects to the various levels of the independent variables. The researcher can define the independent variables but cannot manipulate them. For

these reasons, it is very difficult to attribute causality to an independent variable. If there is a systematic difference in a dependent variable associated with levels of an independent variable, the two variables may be related, but no causal relationship is implied (Tabachnick & Fidell, 2001). Eventually, a judgment will need to be made as to whether that statistical association represents a cause-effect relationship between the independent and dependent variables. Unfortunately, this kind of judgment requires inferences that reach beyond the data from any single study (Hennekens & Buring, 1987).

Uncertainty in the cause and effect association complicates the process for establishing causality; a critical component in an administrator's decision to institute research-based policy. Since the data from a single quasi-experimental study is insufficient for this purpose, more extensive criteria have evolved to support the claim of causal inference. They include the following:

- *Strength of Association:* The greater the magnitude of the effect size, the less likely the association is spurious.
- *Consistency:* Repeated observation of an association in independent studies.
- *Temporality:* Documentation that cause precedes effect in time.
- *Response Relationship:* Outcome relates to the intensity, frequency, or duration of a treatment or exposure (or a combination of these).
- *Coherence of Evidence:* The observed relationship is consistent with what is known about underlying theory, models, natural history, or biology.

Given a nonexperimental traffic safety research agenda and the attendant causal indeterminacy problem, the Transtheoretical Model offers several advantages to traffic safety research, including:

- *Face Validity:* The TTM contains motivational components familiar to those identified by traffic safety researchers who consider them to be efficacious, even essential treatment elements. Therefore, acceptance of the TTM would be enhanced due both to familiarity and an intuitive understanding of its precepts.
- *Outcome and Recalcitrance:* The TTM has consistently demonstrated significant results even with intractable subjects and immutable behaviors. Consequently, the TTM provides a blueprint for the development of better treatments capable of producing larger effect sizes even with the most recalcitrant negligent operators. Large effect sizes are imperative when conducting quasi-experimental research.
- *Research Agenda:* Causal indeterminacy demands vision, a mental image of the succession of studies needed to establish consistency through corroborative research. TTM research has blazed that trail and those efforts could serve as a compass for future traffic safety research.

- *Causal Indeterminacy*: The TTM provides an immediate and large comparison group of research studies that examines the effects of treatments on behavior change. To the extent that this research demonstrates a coherence of evidence, the TTM may be an appropriate yardstick to address the causal indeterminacy problem.
- *Similarity of Purpose*: The TTM has guided research associating the relationships between treatments and behavior change across a wide spectrum of subjects highly resistant to intervention and change, including alcoholics, smokers and heroin addicts. Traffic safety research is also concerned with populations that are highly resistive to interventions. Concerning alcoholism, the traffic safety researcher interfaces with the same individuals as the TTM researcher, with the added public safety risk associated with alcoholics operating motor vehicles on congested roadways.
- *ENOTES*: These criteria are not only critical to the establishment of causality but also to the design of the new Enhanced Negligent Operator Treatment and Evaluation System. First of all, the small, directional, and suggestive effect sizes reported in past negligent operator treatment and evaluation system reports may support claims of causal associations between advisory letters and reductions in violations and crashes when generated from experimental research designs. However, they will be insufficient in the future when traffic safety research in California is limited to quasi-experimental research. As a result, more potent treatments will need to be developed and the best way to accomplish that is through a systematic, disciplined program of research that is guided by theory or a model of quantum change, such as the TTM, that has already demonstrated strong, positive results.

METHODS

This critical review of the traffic safety literature commenced as a means to gather intervention data essential to the development of an enhanced negligent operator treatment and evaluation system (ENOTES). Specific objectives were to develop a comprehensive bibliography of relevant research, obtain copies of the individual studies, estimate the strength of the scientific evidence supporting the various treatment methods, develop a scientifically rigorous procedure to evaluate the effectiveness of the new ENOTES program, and report the results.

The traffic safety component of the literature review focused primarily on negligent operator studies that exploited letter-style treatment methods. However, bibliographic considerations extended beyond the traffic safety literature to include references on the psychology of change (Prochaska & DiClemente, 1982, 1984; Miller & Rollnick, 1991) and goal attainment scaling (Kiresuk, et al., 1994).

Articles were obtained from libraries, governmental agencies, and other sources. The most complete collection of relevant reports was housed in the Research and Development Branch library located at the Department of Motor Vehicles, Sacramento, California.

A total of 198 references were accumulated from journal articles and previously published literature reviews. Approximately 58 of the original articles were eliminated from further consideration due to titles that intimated unsuitable content. The remaining 140 references formed the pool of studies to be reviewed for information pertaining both to letter-style treatment methods, and to components within the letter treatments shown to be effective change agents. Of the 140 titles reviewed in the initial stage, 46 were found to contain treatments other than advisory letters. The remaining 94 studies were included in the second phase of the literature review. A total of 44 of these were traffic safety studies and the other 50 involved research articles in the fields of transformational psychology and goal attainment scaling. Approximately 70 studies contained information relevant to this study and are cataloged in the reference section. The balance of the studies was deemed inappropriate due to missing treatment letters, insufficient information to allow an evaluation of design or methods quality, redundant information, and unsatisfactory content.

Special attention was devoted to traffic safety studies containing information relevant to letter treatments. Specifically, traffic safety researchers' comments regarding the components critical to the success of letter treatment were collected for further analysis. There were two purposes for this approach. The first was to gather data that would be used later to develop the criteria needed to create a metric that would enable the actual contents of the warning letters to be evaluated on the same scale. The second purpose was to determine whether the composite of recommendations regarding letter treatments would resemble an established theory of change in a different field from traffic safety.

The next step involved a selective review of the psychology of change literature in search of a theory of change that contained some or all of the recommendations that traffic safety researchers had suggested to strengthen the effectiveness of warning letters. After sufficient evidence was gathered to confirm that changes associated with short-term treatments (quantum changes) were reported in the traffic safety literature, and that a theory of quantum change had been described in the transformational psychology literature and validated with populations known to be resistant to change, the project's remaining objectives could be satisfied. The result of this exercise also demonstrated the evolution of traffic safety thinking and documented its progress toward a theory of behavioral change. Finally, the TTM elements were used to construct a metric that was used to assess the quality of the "warning letters" mailed to negligent operators by state regulatory agencies.

The criteria used to evaluate the quality of the research and validity of the treatment methods evolved with a growing awareness that many of the administered treatments lacked a theoretical basis, and several of the studies neither provided examples of the advisory letters sent to negligent operators, nor supplied adequate descriptions of their contents. In the final analysis, the quality of the research was estimated from the descriptions of the research design contained in the reviewed studies. One point was awarded for the existence of each of the following six elements: Participation rate of at least 70%; no-treatment control group; random assignment; similar subject

characteristics; researcher blinded to randomization schedule; and, temporality, the evidence that treatment preceded outcome. The minimum and maximum possible points ranged from 0 to 6. These points were then multiplied by a factor of four to arrive at the final Design Quality score that ranged from 0 to 24. The factor of four was established to emphasize that the design is the most important consideration in research.

The quality of the treatment letters was determined from an assessment of the number of TTM elements used in their construction, multiplied by a factor of three for the general methods, a factor of two for the early stage techniques, and a factor of one for the late stage components. The quality scores were allowed to range between 0 and 18, 0 and 10, and 0 and 5 for the general, early, and late stage elements, respectively. Therefore, 33 would represent a perfect score across all 16 TTM components. The general strategies were multiplied by three, the largest TTM factor, because the balance of the methods used in the early and late stages of change will be less powerful in the absence of the general strategies. The factor of two used to multiply the early stage points reflects its relative importance to the general and late stage elements.

An evaluation sheet (Appendix A-1) was developed for the purpose of assessing each study containing advisory treatment-letters or sufficiently detailed descriptions of treatment contents. This evaluation sheet recorded the study's title, author, source, date, design characteristics scores, general strategy scores, early-stage strategy scores, late-stage strategy scores, strength of association, and other factors relevant to the evaluation. The evaluated studies were tabulated by the strength of evidence supporting each treatment in terms of the quality of the research and the validity of the methods as defined by the degree to which they reflected components of the Transtheoretical Model of behavior change that was used as the assessment instrument.

Goal Attainment Scaling

Goal attainment scaling was also used in an attempt to define five levels of expectation for each of the 16 TTM elements. Originally, it had been thought that this method would provide a framework for an evaluation tool of sufficient sensitivity to distinguish fine gradations of dissimilarity among the sentences used in the various letter treatments to convey messages relevant to specific TTM change elements.

Goal Attainment Scaling (GAS) was developed in the 1960's to address the especially difficult evaluation needs within the mental health community (Kiresuk & Sherman, 1968). Since then, GAS has been applied to an expanding universe of fields including education, social work, psychology, and even business (Kiresuk et al., 1994).

The technique requires desirable and undesirable outcomes to be documented in an unambiguous manner through descriptive statements or quantitative data. Because GAS is a dynamic concept, the goals and measurable outcomes defined can be subject to continuous review and assessment to ensure that changing circumstances are not neglected.

In the course of collecting and examining the data on the contents of the treatment letters, it was discovered that the letters were not sufficiently developed and varied to permit the use of goal attainment scaling to help discriminate their contents vis-à-vis the TTM change elements. Although goal attainment scaling as developed by Kiresuk and Sherman (1968), ultimately was not used, a three-point scale based on goal attainment scaling was used to assess the contents of treatment letters.

Treatment Letters

This research project centered upon the contents of advisory letter treatments. Regrettably, research reports rarely enclosed copies of the treatment letters used in the studies. Because many reports are 30 or 40 years old, it is extremely difficult to secure relevant treatment letters. California, for instance, does not archive copies of discarded treatment letters. However, the Research and Development Branch within California's Department of Motor Vehicles has an informal archive of these valuable research tools. Unfortunately, many of the old letters are not dated and the time periods in which they were used were not recorded. Nonetheless, the vast majority of the 42 treatment letters located and evaluated in this literature review came from this source. Given the potential importance of these letters for further research efforts, their contents were recorded and preserved in Appendices B-1 to B-31. Letters identical or closely similar to other treatments were not duplicated. Therefore, only 31 letters have been memorialized in the Appendices.

Generalizability

Caution needs to be exercised before deciding to generalize the following results beyond this study. The treatment letters evaluated were selected neither on a random basis nor on information that the recipients were comparable with respect to other risk factors for crashes and citations. Letter treatments were selected on the basis of availability and those associated with the studies conducted from 1985 to 1994 were changed often and may have been used singly or in combination with other treatments in one or more studies. Therefore, the validity of the individual study results is not assured, and it is clearly not possible to generalize an invalid result (Hennekens & Buring, 1987).

RESULTS

The warning letters evaluated for this critical review varied in their contents. Some incorporated more of the 16 TTM elements than others and a few contained a richer combination of elements across the three major components than most. The evaluation was limited to a total of 42 treatment letters used in 13 negligent operator treatment evaluation studies.

Design Quality

Overall, the design quality of the studies using letter treatments was excellent. The Kaestner and Speight (1975) Last Chance Warning Letter study and the Sherman and Ratz (1979) study each received scores of 12, the lowest of any of the studies. The first study provided insufficient information to determine whether or not the groups demonstrated similar subject characteristics, leaving doubt about the randomness of assignments. In addition, since significant departures from the research plan occurred as a result of the defensive driving component of the study being available only to subjects in proximity to population centers, doubts were raised about whether the researchers were blinded to the randomization scheme. Finally, the authors did not employ a no-contact control group.

The Sherman and Ratz (1979) study did not achieve a participation rate of 70% or more, did not provide for a no-contact control condition, and did not offer sufficient information to determine if the researchers were blinded to the randomization schedule.

The McBride and Peck (1970) study is the best in terms of what these authors accomplished in isolating the components of the treatment letters. However, the design quality received a score of 16 of a possible 24. There was some question about the level to which the authors were blinded to the randomization schedule since that procedure had to be adjusted to equalize the cells. Also, significant differences were found in the subject characteristics among the groups, giving rise to doubts about the integrity of the random assignment process.

The balance of the studies earned either 20 or 24 points out of a possible 24. Overall, the designs were outstanding. However, the warning letters themselves were weaker, generally containing too few components strongly linked to a theory of behavior change.

Transtheoretical Model of Change

Prochaska and DiClemente (1982) studied the steps traversed by individuals in the course of unassisted self-change efforts and, in the process, discovered an underlying, systematic process capable of predicting readiness to change. Their subsequent research confirmed that the change phenomenon progresses through the same steps with or without professional assistance (Prochaska and DiClemente, 1984). The stages through which individuals pass in the process of changing a behavior include: pre-contemplation, contemplation, determination, action, maintenance, and relapse. Each stage describes a person's readiness to change and specifies effective General, Early, and Late Stage strategies to motivate the individual to move toward the next stage and eventual success.

General Elements

One important general stage element is to provide Feedback to the person who is targeted for change. All of the letters examined provided this Feedback by including information about crashes and convictions on the person's driver record. Technically, this category should have been scored based upon systematic feedback, instead of a

one-shot notification. However, any reference to the driver's record was determined to be sufficient to satisfy this element.

It was surprising to find that fewer than half (41%) of the letters provided direct advice to the drivers regarding the state's expectations. Although many warning letters provided ample doses of sarcasm and less than subtle threat, more than half failed to provide direct advice about expectations.

About 43 percent of the letters communicated confidence in the ability of the driver to change dangerous behaviors, 36 percent mentioned the negligent driver's personal responsibility to change driving behaviors that threaten the public safety, one-third expressed empathy for the negligent operator, and finally, a mere 14 percent of the warning letters offered a choice of change strategies, even though that is a powerful technique used to motivate any individual contemplating change.

Early Stages of Change

Nearly all the warning letters (98%) provided information regarding the nature and risk of unsafe driving behaviors as a means to raise the negligent operator's consciousness. Approximately 60 percent of the letters provided dramatic relief in which the negligent operator's emotions were consciously elevated before offering assurance that the situation was in the control of the driver. Environmental reevaluation was utilized in 29 percent of the treatments through various methods intended to allow the driver to reflect upon the possible consequences of negligent driving behaviors on innocent others. Self-reevaluation was attempted in 10 percent of the interventions and social liberation was ignored, totally.

Late Stages of Change

These five behavioral elements were the most infrequently used of the sixteen methods available in the TTM. Nineteen percent offered help to the negligent operator and ten percent attempted to apply contingency management techniques. Unfortunately, the other three elements, stimulus control, counter conditioning, and self-liberation, were not used at all.

The Studies

A total of 42 letter treatments were evaluated. Although letters usually were not identical to each other, the modest changes in wording often were not accompanied by the use of additional TTM components. Generally, with a few exceptions, the advisory letter contents made poor use of the available elements (Appendix A-4).

The evaluation of the treatment letters included a calculation of the percentage of letters that applied each of the TTM elements, and these are shown in Table 1 below.

Table 1 illustrates two major points. The first is that the Marsh studies (1985–1995) used treatment letters that incorporated fewer TTM elements than the balance of the studies reviewed. The second point is that treatment letters utilized progressively fewer elements from the later stages of the three-stage TTM model.

Table 1
Percent of Treatment Letters Using Each TTM Element

Elements		All 42 letters	24 Marsh letters (1985-1995)	18 other letters
General stage	Systematic feedback	42 / 42 (100%)	24 / 24 (100%)	18 / 18 (100%)
	Personal responsibility	15 / 42 (36%)	4 / 24 (17%)	11 / 18 (61%)
	Direct advice	17 / 42 (41%)	11 / 24 (46%)	6 / 18 (33%)
	Choice of strategy	6 / 42 (14%)	0 / 24 (0%)	6 / 18 (33%)
	Express empathy	14 / 42 (33%)	7 / 24 (29%)	7 / 18 (39%)
	Strengthen self efficacy	18 / 42 (43%)	8 / 24 (33%)	10 / 18 (56%)
Early stage	Consciousness raising	41 / 42 (98%)	24 / 24 (100%)	17 / 18 (94%)
	Dramatic relief	25 / 42 (60%)	12 / 24 (50%)	13 / 18 (72%)
	Environmental reevaluation	12 / 42 (29%)	6 / 24 (25%)	6 / 18 (33%)
	Social liberation	0 / 42 (0%)	0 / 24 (0%)	0 / 18 (0%)
	Self reevaluation	4 / 42 (10%)	4 / 24 (17%)	0 / 18 (0%)
Late stage	Stimulus control	0 / 42 (0%)	0 / 24 (0%)	0 / 18 (0%)
	Helping relationships	8 / 42 (19%)	3 / 24 (13%)	5 / 18 (28%)
	Counter conditioning	0 / 42 (0%)	0 / 24 (0%)	0 / 18 (0%)
	Contingency management	4 / 42 (10%)	0 / 24 (0%)	4 / 18 (22%)
	Self liberation	0 / 42 (0%)	0 / 24 (0%)	0 / 18 (0%)
Total		206 / 672 (31%)	103 / 384 (27%)	103 / 288 (36%)

Kaestner et al., 1965

RATINGS:

Design Quality: 20 / 24

Standard Form Letter: 13 / 33

Personalized Standard Letter: 13 / 33

Personalized Soft-Sell Letter: 17 / 33

The Oregon Department of Motor Vehicles studied the effects of the form and content of driver improvement warning letters on subsequent driving records as early as 1965 (Kaestner, et al.). Three different letters were sent to male drivers over the age of 16 and their effects on traffic safety were compared with the records of a no-contact control group. The number of records in the control, standard form, personalized standard form, and personalized, soft-sell letter groups were 240, 241, 233, and 233, respectively.

The standard warning letter (Appendix B-1) had the appearance of a bureaucratic correspondence from a governmental agency, referencing the driver's license number and providing feedback about the agency's policy toward negligent operators. The personalized warning letter (Appendix B-2) contained identical information to the standard letter except for the driver license number, which was replaced with a salutation. The third warning letter was called the "soft-sell letter" (Appendix B-3) because it was personalized, less threatening and more encouraging.

Because the standard and personalized letters both contained identical components of the TTM, only the evaluation of the standard letter appears in the first summary form (Table 2). Of the six elements common to any change strategy, the letters provided systematic feedback, mentioned personal responsibility and made an attempt to strengthen self-efficacy. Neither warning letter provided direct advice, offered a choice of strategies, or expressed empathy. Concerning the early stage elements, both letters made an attempt to raise consciousness and provide dramatic relief but did not address environmental reevaluation, social liberation, or self-reevaluation. Regarding the late stage elements (stimulus control, helping relationships, counter conditioning, contingency management, and self liberation), none were used in the letters.

The soft-sell letter differed from the others in two ways: it contained a higher than expected empathic component and it offered a helping relationship. With regard to all other TTM elements, the soft-sell letter was equivalent to the personalized correspondence.

Table 2

Kaestner et al., 1965: Standard Letter

Design Characteristics	Score	General stage	Score	Early stage	Score	Late stage	Score
Participation rate 70%	4	Systematic feedback	3	Consciousness raising	2	Stimulus control	0
No-treatment control	4	Personal responsibility	3	Dramatic relief	2	Helping relationships	0
Random assignment	4	Direct advice	0	Environmental reevaluation	0	Counter conditioning	0
Similar subject characteristics	0	Choice of strategy	0	Social liberation	0	Contingency management	0
Blinded to random schedule	4	Express empathy	0	Self reevaluation	0	Self liberation	0
Temporality	4	Strengthen self-efficacy	3				
Total	20		9		4		0

Both six and twelve month results for the four groups were based upon the proportion of drivers who remain “trouble free” (successes), which was defined to mean any of the following: no entry for any traffic violation during the relevant time period; only minor violations such as equipment infractions, excessive noise, and axle overload; and no chargeable accidents. Comparisons involved successes of each of the three treatment groups versus controls. No differences were detected for the standard letter. At the end of six months, significantly fewer traffic involvements were recorded for the group receiving the personalized letter; and at the end of one year, significantly fewer traffic entries were made to the driving records of the group receiving the personalized, soft-sell letter. The superior results of those receiving either the personalized or soft-sell letters was attributed to the more favorable reception given the correspondence, which resulted in a more positive response to the message. However, an age-gradient was reported since all of the identified differences were due to the population of drivers under the age of 25. According to Prochaska and DiClemente (1982), an age-gradient can be viewed as a proxy for any number of other differential effects, including “readiness to change”.

Kaestner et al. (1965) reported that the results, “support the contention that it is in fact possible to modify long range, nonverbal behavior by one shot verbal appeals. However, it must be recognized that the content and, to at least as great an extent, the formal appearance of the appeal is of critical importance.” This quotation implies that quantum change (Miller & C’de Baca, 1994) is a realistic goal for negligent operator treatment systems.

Marsh, 1969

RATINGS:

Design Quality: 16/24

Warning Letter: 16/33

In 1966, there were 415,000 reported collisions on California’s roadways, which accounted for 4,830 deaths and approximately 230,000 injuries. The California Department of Motor Vehicles calculated associative costs totaling \$764,000,000, or \$1,800 per reported collision (1968).

In this study, the California Department of Motor Vehicles evaluated eight driver improvement techniques, including a warning letter. Between December 1965 and September 1966, 15,293 California drivers were selected from pre-established criteria, including the condition that the driver had no record of previous contact by DMV in regard to the Negligent Operator Program. Each driver was assigned to one of the eight techniques or to the control group. However, “clerical distortions” may have introduced a bias into the selection process causing significant differences in subject characteristics between treated and control subjects. Therefore, a determination was made that insufficient information existed to ascertain whether or not the researcher was blinded to the randomization schedule. Concerning other design characteristics, the participation rate exceeded 70 percent, there was a no-contact control condition, and the treatment clearly preceded the outcome.

Each subject in the treatment group was sent the standard warning letter that was in use as part of the regular driver improvement program. In 1965, the standard warning

letter commenced with the word, “WARNING”, prominently displayed at the top. The body of the letter conveyed an official tone with a quotation taken from the California Vehicle Code and threats of suspension or revocation.

In terms of the TTM (Table 3), the warning letter (Appendix B-4) used four of the six general strategies at minimal levels. Systematic feedback consisted of a reminder that the driver had accumulated traffic law violations. Personal responsibility was stressed through a statement that the driver’s privilege to use the state’s roadways would be based upon driving performances. The letter also made an attempt to strengthen self-efficacy by indicating the belief that the driver had the ability and desire to change negligent driving habits. Although direct advice was provided in one short sentence, it was very general, almost platitudinous, when it could have been more direct and meaningful. However, the warning letter did not provide the driver with a choice of strategies and did not express empathy.

Of the five early stage strategies, the warning letter used two, dramatic relief and consciousness raising. Dramatic relief was provided by stressing the fact that the individual’s driving privilege was in jeopardy, but at the same time, making assurances that the negligent operator could ultimately control the situation by improving the driving record. There were examples of at least four consciousness-raising efforts in the warning letter, thereby earning a +1 rating for this technique. However, they were somewhat repetitive and consumed valuable space that could have been used for other strategies, if the consciousness-raising strategy had been more finely tailored. Environmental reevaluation, social liberation, and self-reevaluation were not utilized in the warning letter.

Of the late stage strategies (stimulus control, helping relationships, counter conditioning, contingency management, and self-liberation), none were present in the warning letter.

Table 3
Marsh, 1969: Warning Letter

Design Characteristics	Score	General stage	Score	Early stage	Score	Late stage	Score
Participation rate 70%	4	Systematic feedback	3	Consciousness raising	2	Stimulus control	0
No-treatment control	4	Personal responsibility	3	Dramatic relief	2	Helping relationships	0
Random assignment	4	Direct advice	3	Environmental reevaluation	0	Counter conditioning	0
Similar subject characteristics	0	Choice of strategy	0	Social liberation	0	Contingency management	0
Blinded to random schedule	0	Express empathy	0	Self reevaluation	0	Self liberation	0
Temporality	4	Strengthen self-efficacy	3				
Total	16		12		4		0

The study's outcome measures were the number of collisions and convictions in the year following a subject's assignment to a treatment group. Adjusted rates were used in order to disregard differences in subsequent driving records attributable to age, gender, prior convictions, and other relevant factors. The fact that some of these attributes differed among groups casts doubt on the randomness of the selection process.

The adjusted collision rates for males, females, and both genders combined in the warning letter group were determined to be no different from those of the control group during the year subsequent to the subjects' selection. Subsequent adjusted conviction rates for both males and combined genders in the warning letter group were found to be significantly different from those of the control group but the rates for females affirmed the null hypothesis.

McBride and Peck, 1970

RATINGS:

Design Quality: 16/24

Standard Letter: 6/33

High Threat/High Intimacy: 18/33

High Threat/Low Intimacy: 10/33

Low Threat/High Intimacy: 24/33

Low Threat/Low Intimacy: 24/33

The importance of this pioneering effort to evaluate the effectiveness of the specific elements of warning letters to catalyze quantum change in negligent operators is monumental. At the time this study was published, only Kaestner, et al. (1965, 1967) had studied the impact of warning letter components (McBride & Peck, 1970). However, this study elevated the rigor associated with the approach.

As early as 1969, more than 100,000 negligent operators were involved in some form of postlicensing control action each year in California. The general procedure was to increase the intensity of the treatments as a function of driver recidivism. However, these authors recognized the wisdom of improving warning letter treatments as a means of reducing the need for increasingly stringent and expensive alternative treatments. Their rationale was simple: a letter contact is less expensive than a meeting; a large population of negligent operators can be easily contacted; it may be possible to make a letter as effective as a meeting, and; a letter can reach negligent operators before there is a need to resort to more punitive measures. Naturally, the success of this strategy would depend upon the identification of letter components with the power to increase the effectiveness of the letter treatments.

From November 1966 through January 1967, 18,000 negligent operators were selected from the central driver record files at the California Department of Motor Vehicles, and randomly assigned to one of four treatment conditions based on the fourth and fifth digits of the eight digit driver license number. However, the procedure needed to be modified at times to equalize the treatment cells. These drivers became eligible by

meeting a set of criteria, which included approaching or reaching the *prima facie* definition of negligent operator. The alpha level was set at .20.

This study met four of the six quality criteria; the participation rate exceeded 70 percent, there was a no-treatment control group, random assignment procedures were implemented, and treatment definitely preceded outcome. There is some question about the level to which the authors were blinded to the randomization schedule since that procedure had to be adjusted to equalize the cells. Finally, significant differences were found in subject characteristics among the groups.

The study began with the development of the experimental warning letters (Appendices B-5 to B-9). McBride (1967) conducted a review of the mass communication, marketing, advertising and behavior modification literatures to identify two dimensions for manipulation: intensity of threat, and intimacy in the style of the written message. The levels of threat were developed from Semantic Differential Scales identified through a review of independent studies. Intensity of the intimacy dimension varied according to the use of personal pronouns.

Although the letters were developed to represent three levels of each dimension for a total of nine possible combinations, practical considerations reduced the final number of letters used in the research to four: high threat/high intimacy; high threat/low intimacy; low threat/high intimacy; and, low threat/low intimacy. Including the standard letter used at the time of the research, five letters were evaluated. The criteria for the evaluation of treatment effects were total accidents and countable traffic violations.

Standard letter. "In this study, the low threat and standard letters, both very formal, were the best overall treatments" (McBride & Peck, 1970). The standard letter (Appendix B-5) when combined with the questionnaire was effective for both accident ($t = -1.88, p < 0.05$) and violation ($t = -2.47, p < 0.01$) reductions for a period of seven months after treatment. The authors reported that the t-test results are at least "suggestive of a treatment effect" (McBride and Peck, 1970).

Concerning the TTM (Table 4), the standard warning letter used one of the six general strategies at a minimal level. Systematic feedback consisted of a short sentence advising the driver that the department has found several entries of unsafe driving. Meanwhile, personal responsibility was not mentioned, no direct advice was given, no choice of strategies was provided, empathy was not expressed, nor was there any attempt to strengthen self-efficacy.

Only one of the five early stage strategies, consciousness raising, was incorporated into the letter. Unfortunately, that strategy was wasted when it was written in the form of a threat that was not linked to a statement of personal responsibility. Again, the other four strategies were ignored. There was no effort to reduce the negative effect of the threat by turning it into dramatic relief, no environmental reevaluation efforts were attempted, social liberation was ignored, and self-reevaluation was not promoted.

Table 4
McBride & Peck, 1970: Standard Letter

Design Characteristics	Score	General stage	Score	Early stage	Score	Late stage	Score
Participation rate 70%	4	Systematic feedback	3	Consciousness raising	2	Stimulus control	0
No-treatment control	4	Personal responsibility	0	Dramatic relief	0	Helping relationships	1
Random assignment	4	Direct advice	0	Environmental reevaluation	0	Counter conditioning	0
Similar subject characteristics	0	Choice of strategy	0	Social liberation	0	Contingency management	0
Blinded to random schedule	0	Express empathy	0	Self reevaluation	0	Self liberation	0
Temporality	4	Strengthen self-efficacy	0				
Total	16		3		2		1

Of the late stage strategies, a helping relationship was specifically suggested in the standard letter. On the other hand, stimulus control, counter conditioning, contingency management, and self-liberation were not attempted.

High threat/high intimacy letter. The high threat, high intimacy letter (Appendix B-6) utilized four of the six TTM general strategies: systematic feedback, personal responsibility, expressing empathy, and strengthening self-efficacy (Table 5). While this letter, when combined with the questionnaire, was found to be significantly better ($p < 0.05$) than the control for adjusted seven-month accident means; no differences were found for convictions.

Systematic feedback and consciousness-raising are often seen in a single sentence. For instance, this letter provided feedback about the subject's driving record and, at the same time, stated that the driving privilege was in jeopardy because of that record. However, the letter neither furnished direct advice to the negligent operator nor provided a choice of strategies to improve driving performance. Commonly, negligent operator warning letters will include a sentence or two about the preferred driving behavior but it is rather rare for an advisory letter to state that preference in the form of direct advice.

Table 5

McBride & Peck, 1970: High Threat/High Intimacy Letter

Design Characteristics	Score	General stage	Score	Early stage	Score	Late stage	Score
Participation rate 70%	4	Systematic feedback	3	Consciousness raising	2	Stimulus control	0
No-treatment control	4	Personal responsibility	3	Dramatic relief	2	Helping relationships	0
Random assignment	4	Direct advice	0	Environmental reevaluation	2	Counter conditioning	0
Similar subject characteristics	0	Choice of strategy	0	Social liberation	0	Contingency management	0
Blinded to random schedule	0	Express empathy	3	Self reevaluation	0	Self liberation	0
Temporality	4	Strengthen self-efficacy	3				
Total	16		12		6		0

The high threat and high intimacy letter employed three of the early stage strategies: consciousness-raising should have increased the probability of discontinuing the current driving habits, shifting the decisional balance away from the status quo; dramatic relief increased the driver's anxiety about the potential official consequences of negligent driving and then reinforced the idea that the driver was in control of the penalties, if any, that would need to be levied; and environmental reevaluation, a technique used to transform the driving record into a statement about the increased risk that negligent behaviors present to self and others. The other two, social liberation and self-reevaluation, were not used. Finally, none of the five late stage strategies were used. Late stage methods were the most routinely ignored across the entire set of letter treatments evaluated for this literature review.

High threat/low intimacy letter. The high threat and low intimacy letter (Appendix B-7) implemented just two of six general strategies of the TTM, two of five early stage and none of the five late stage strategies (Table 6). High threat treatment letters are characterized by the use of far fewer general change strategies, marginally fewer early stage techniques, and no late stage change approaches. This letter was not found to be significantly different from the control condition regarding accident reduction. But, when combined with the questionnaire, it was found to be significantly superior ($p < 0.05$) to the control for adjusted seven-month violation means.

Systematic feedback and consciousness-raising were both presented in highly threatening statements such as, "YOU ARE IN DANGER OF HAVING YOUR DRIVING PRIVILEGE WITHDRAWN!" and "This section empowers—and in fact

obligates—the Department of Motor Vehicles to utilize its discretionary authority in taking hazardous drivers off the streets and highways”. These sentences validate Campbell’s (1958) vision of a bureaucracy more deeply dedicated to punishment than behavior change.

Even the attempt at environmental reevaluation was punitive and might tend to generate anger rather than positive change. Comments like, “Statistics clearly indicate that irresponsible driving patterns such as yours often result in the maiming of innocent people and in destruction of human life”, give credence to Warren’s (1981) reminder that the effectiveness of any treatment letter will be affected by the driver’s perceptions of the Department’s motivations.

Table 6

McBride & Peck, 1970: High Threat/Low Intimacy Letter

Design Characteristics	Score	General stage	Score	Early stage	Score	Late stage	Score
Participation rate 70%	4	Systematic feedback	3	Consciousness raising	2	Stimulus control	0
No-treatment control	4	Personal responsibility	3	Dramatic relief	0	Helping relationships	0
Random assignment	4	Direct advice	0	Environmental reevaluation	2	Counter conditioning	0
Similar subject characteristics	0	Choice of strategy	0	Social liberation	0	Contingency management	0
Blinded to random schedule	0	Express empathy	0	Self reevaluation	0	Self liberation	0
Temporality	4	Strengthen self-efficacy	0				
Total	16		6		4		0

Even an opportunity to strengthen self-efficacy while stressing personal responsibility was missed when the words took on a venomous tone, “It is never too late to improve, but in your case, improvement must be immediate if restrictive action is to be avoided”.

Low threat/high intimacy letter. The low threat/high intimacy letter (Appendix B-8) employed all six general strategies, three of the early stage methods, but none of the late stage techniques (Table 7). This correspondence, when combined with the questionnaire, was significantly better ($p < 0.05$) than the control condition for adjusted seven-month accident means. The letter-questionnaire combination was also significantly superior ($p < 0.05$) to the control for adjusted violation means.

In terms of the TTM, this letter is very similar to the low threat and low intimacy letter. The difference appears to involve the increased solicitous, personal tone, that the

authors refer to as “intimacy”. Four strategies (express empathy, strengthen self-efficacy, dramatic relief, and environmental reevaluation) were scored as providing, “More than expected treatment/TTM match (+1)”. This increased level of “intimacy” appears to have provided an extra cushion of safety for the public.

Table 7

McBride & Peck, 1970: Low Threat/High Intimacy Letter

Design Characteristics	Score	General stage	Score	Early stage	Score	Late stage	Score
Participation rate 70%	4	Systematic feedback	3	Consciousness raising	2	Stimulus control	0
No-treatment control	4	Personal responsibility	3	Dramatic relief	2	Helping relationships	0
Random assignment	4	Direct advice	3	Environmental reevaluation	2	Counter conditioning	0
Similar subject characteristics	0	Choice of strategy	3	Social liberation	0	Contingency management	0
Blinded to random schedule	0	Express empathy	3	Self reevaluation	0	Self liberation	0
Temporality	4	Strengthen self-efficacy	3				
Total	16		18		6		0

Low threat/low intimacy letter. The low threat/low intimacy letter (Appendix B-9) made use of all six general strategies, three of five early stage techniques, and none of the late stage approaches (Table 8). Of the five letters evaluated in the current section, this form was the only letter found to be associated with significantly fewer accidents ($p < 0.05$) than the control condition when used either with or without the questionnaire. However, the low threat and low intimacy letter was not found to be an effective deterrent for violations.

Systematic feedback was handled in a straightforward manner without the acrimony and hostility identified in other warning letters. Personal responsibility was emphasized directly with a concise statement, “Henceforth, your case will be reviewed on a periodic basis and any further action will depend upon your future driving performance”. The letter provided direct advice regarding expected behavior and intimated a choice of strategies to follow. The tone was empathetic and an explicit attempt was made to strengthen the subject’s resolve to improve.

Table 8

McBride & Peck, 1970: Low Threat/Low Intimacy Letter

Design Characteristics	Score	General stage	Score	Early stage	Score	Late stage	Score
Participation rate 70%	4	Systematic feedback	3	Consciousness raising	2	Stimulus control	0
No-treatment control	4	Personal responsibility	3	Dramatic relief	2	Helping relationships	0
Random assignment	4	Direct advice	3	Environmental reevaluation	2	Counter conditioning	0
Similar subject characteristics	0	Choice of strategy	3	Social liberation	0	Contingency management	0
Blinded to random schedule	0	Express empathy	3	Self reevaluation	0	Self liberation	0
Temporality	4	Strengthen self-efficacy	3				
Total	16		18		6		0

The low threat/low intimacy letter made good use of three early stage strategies. Consciousness-raising melded with systematic feedback to increase the subject's anxiety about the possible consequences of negligent driving. However, these apprehensions were allowed to subside (dramatic relief) through a technique that reinforced the subject's power to control the situation through future driving behaviors. Finally, the warning letter employed an environmental reevaluation technique when it reinterpreted the driving record in terms of elevated risk to self, loved ones, and innocent others.

Taken as a whole, the ANOVA summary for violations during the five-months subsequent to reinforcement found that the treatment by intimacy interaction was significant ($F = 10.48$, $p < 0.001$), indicating that an interaction not evident in the first 7 months emerged in the last 5 months and is unrelated to reinforcement. This appears to indicate that some enduring quality of the treatment and/or the intimacy dimensions interacts with time to exert a positive effect long after treatment.

Meanwhile, the ANOVA summary for accidents during the seven-months post treatment indicated a significant threat dimension effect ($F = 3.05$, $p < 0.10$) with low threat treatments producing significantly more accident reductions than high threat treatments.

In addition, the ANOVA summary for accidents during the five-months subsequent to reinforcement found that the reinforcement by threat ($F = 3.20$, $p < 0.10$) and reinforcement by intimacy by threat ($F = 3.61$, $p < 0.10$) interactions were significant. These results indicate that the reinforcement effect is significantly larger when accompanied by low threat and/or high intimacy treatments.

Finally, the positive accident reductions due to the interaction of the questionnaire with the intimacy dimension ($F = 3.10$, $p < 0.10$) can be viewed in a similar fashion to the delayed effect of treatment by intimacy.

Epperson and Harano, 1975

RATINGS:

Research Design: 20/24

Standard Form Letter: 6/33

Low Threat/High Intimacy: 24/33

Pamphlet: 15/33

Reinforcement Letter: 7/33

In this study, Epperson and Harano (1975) analyzed the effectiveness of two types of warning letters (standard and low threat/high intimacy), an informational pamphlet, and a follow-up reinforcement letter (Appendices B-11 to B-14). A total sample of 16,513 drivers throughout California was selected from the central driver record files located at DMV headquarters. These drivers became eligible for the warning letter program by accumulating three negligent operator points within the previous 12 months. The subjects were assigned to the various treatment groups in a functionally random selection process based upon the final digit of the driver's license number. The alpha level was set at .10.

This study met five of the six quality standards: the participation rate exceeded 70%; a random assignment procedure was used; no significant differences were found among the groups for sample size, percent males, percent married, age, or prior collisions and convictions; the researchers apparently were blinded to the randomization schedule; and, treatment preceded outcome. However, the study did not utilize a no-treatment control group.

The research design assigned one-half of the eligible subjects (16,513) to the low threat/high intimacy condition and the other half to the standard warning letter treatment. One-half of each of those two groups received a pamphlet with the treatment. One-half of the pamphlet/treatment combinations (2) were mailed to groups (4) with clean records while the other half went to those groups (4) with convictions of their driving records. An identical distribution was used with the no-pamphlet/treatment combinations. Finally, half of the clean record groups (4) received a follow-up letter.

Concerning the TTM, the low threat and high intimacy letter (Appendix B-12) used all six general strategies, three of five early stage methods, and no late stage techniques (Table 9). Four strategies (express empathy, strengthen self-efficacy, dramatic relief, and environmental reevaluation) were scored as providing, "more than expected treatment/TTM match (+1)". Scores for this version of the warning letter were identical to the low threat and high intimacy letter used in the McBride and Peck (1970) study, which served as a model. However, the two low threat and high intimacy letters were not identical. Although the Epperson and Harano (1975) letter added a single, short

sentence to the McBride and Peck (1970) warning letter, the remaining ten sentences were similar but not indistinguishable (Appendix A-5). In fact, six of the remaining sentences contained different words and expressions.

McBride and Peck (1970) composed their letter with a more empathetic and professional tone, and specifically mentioned the recipient's driving behavior over a specific period of time. On the other hand, the Epperson and Harano (1975) letter sounded as though the author was being personally judgmental about the recipient's driving habits over a non-specified period of time.

A significant pamphlet effect was identified for total collisions ($F = 2.826, p < .10$) and CHP collisions ($F = 4.740, p < .05$), but no significant main effects or interactions were found for either total or countable convictions.

Table 9

Epperson & Harano, 1975: Low Threat/High Intimacy Letter

Design Characteristics	Score	General stage	Score	Early stage	Score	Late stage	Score
Participation rate 70%	4	Systematic feedback	3	Consciousness raising	2	Stimulus control	0
No-treatment control	0	Personal responsibility	3	Dramatic relief	2	Helping relationships	0
Random assignment	4	Direct advice	3	Environmental reevaluation	2	Counter conditioning	0
Similar subject characteristics	4	Choice of strategy	3	Social liberation	0	Contingency management	0
Blinded to random schedule	4	Express empathy	3	Self reevaluation	0	Self liberation	0
Temporality	4	Strengthen self-efficacy	3				
Total	20		18		6		0

There was also a significant letter effect both for total convictions ($F = 4.342, p < .05$) and countable convictions ($F = 3.223, p < .10$), with the low-threat and high-intimacy letter producing superior results to the standard letter (Appendix B-11). However, the reinforcement letter (Appendix B-14) was not found to have significant effects, on either total convictions or countable convictions.

Finally, a significant interaction (letter x pamphlet x reinforcement) effect was found for total convictions ($F = 3.223, p < .10$) and countable convictions ($F = 6.041, p < .05$), indicating that the reinforcement letter only produced significantly superior results to

the standard letter when combined with variables that demonstrated independent effects.

These authors recommended further research into the content dimensions and types of both warning and reinforcement letter treatments.

Kaestner and Speight (1975)

RATINGS:

Design Quality: 12/24

Last Chance Warning Letter: 10/33

The Oregon Traffic Safety Commission and the Motor Vehicles Division of the Oregon Department of Transportation conducted this study jointly. At the time of this research (1975), the authors reported that relatively little was known about the value of negligent operator programs and their component parts.

The objective of this study was to compare the results of a driver improvement suspension with those of the other four treatments: no contact, a last-chance warning letter, a probationary license, and a defensive driving course. However, only the efficacy of the warning letter is considered in this paper.

The 960 drivers selected for this study were drawn from a set of negligent operators eligible for suspension of their driving privileges and randomly assigned to the five treatments. Then, subsequent one-year driving records were compared between the four conditions and the standard suspension. Although there was a no-action control group, the authors were not primarily interested in the warning letter/control group comparison.

The study did not provide sufficient information to determine whether or not the various groups demonstrated similar subject characteristics. In addition, since “significant departures” from the research plan occurred because the defensive driving courses were only available in Portland, Salem, and Eugene, there are concerns that the researchers were not blinded to the randomization schedule. Finally, the authors selected an alpha level of 0.20 (Marsh, 1971) but since the comparisons of interest are all directional, the tabled 0.20 χ^2 values are actually one-tailed 0.10 values (Klugh, 1974).

No significant differences were identified between the suspension and the last-chance warning letter groups for success percentages or average delay in days to failure (moving violation or chargeable collision) for drivers in cities, rural areas, or combined. While the authors viewed these findings as failures of the warning letter, it also could be argued that a simple warning letter has the same deterrent effect as Oregon’s program of discretionary suspension.

Regarding conformity with the TTM (Table 10), the last chance warning letter (Appendix B-15) utilized two of the six general strategies (systematic feedback and express empathy), two of five early stage methods (consciousness raising and dramatic relief), and none of the late stage techniques.

Table 10

Kaestner & Speight, 1975: Last Chance Warning Letter

Design Characteristics	Score	General stage	Score	Early stage	Score	Late stage	Score
Participation rate 70%	4	Systematic feedback	3	Consciousness raising	2	Stimulus control	0
No-treatment control	0	Personal responsibility	0	Dramatic relief	2	Helping relationships	0
Random assignment	4	Direct advice	0	Environmental reevaluation	0	Counter conditioning	0
Similar subject characteristics	0	Choice of strategy	0	Social liberation	0	Contingency management	0
Blinded to random schedule	0	Express empathy	3	Self reevaluation	0	Self liberation	0
Temporality	4	Strengthen self-efficacy	0				
Total	12		6		4		0

Sherman and Ratz (1979)

RATINGS:

Design Quality: 12/24

Probation by Mail Letter: 11/33

Notice of Hearing Letter: 11/33

This study was conducted to compare the traffic safety effects of probation-by-mail with those of the Department's individual hearing intervention. The subjects were 13,899 drivers whose record of convictions approached the California definition of a negligent operator, making them eligible for an individual hearing. All drivers who met the selection criteria between June 1977 and April 1978 were included. However, because those who drove in excess of 25,000 miles per year were excluded from the study, very few subjects held class 1 licenses. Finally, 6,148 drivers (46%) considered "high risk" were ineligible for the probation-by-mail treatment, and thus were omitted from the study. The remaining drivers were assigned either to the probation-by-mail ($n = 3,883$) or individual hearing ($n = 3,868$) groups through a functionally random process utilizing the terminal digit of their drivers' license numbers.

The probation-by-mail letter appeared to be more aggressive than the individual hearing letter due to the use of capital letters to describe the grounds for the action and conditions of probation. In addition, it is very bureaucratic and demanding. On the other hand, the individual hearing letter is simply advisory, even though the potential consequences are expressed in a direct fashion.

Because both letters (Appendices B-16 & B-17) contained identical components of the TTM, only the evaluation of the probation by mail letter is presented below in Table 11. Of the six elements common to any change strategy, the letters provided systematic

feedback and a choice of strategies. Consciousness-raising regarding the seriousness of the traffic record, and fostering dramatic relief were the techniques drawn from early-stage strategies. Finally, contingency management (negative) was the only technique taken from the late-stage strategies. A questionnaire was also included in the study, and respondents indicated on it that they liked that the letter offered them a choice of strategies to change their driving behavior.

Table 11

Sherman & Ratz, 1979: Probation by Mail Letter

Design Characteristics	Score	General stage	Score	Early stage	Score	Late stage	Score
Participation rate 70%	0	Systematic feedback	3	Consciousness raising	2	Stimulus control	0
No-treatment control	0	Personal responsibility	0	Dramatic relief	2	Helping relationships	0
Random assignment	4	Direct advice	0	Environmental reevaluation	0	Counter conditioning	0
Similar subject characteristics	4	Choice of strategy	3	Social liberation	0	Contingency management	1
Blinded to random schedule	0	Express empathy	0	Self reevaluation	0	Self liberation	0
Temporality	4	Strengthen self-efficacy	0				
Total	12		6		4		1

However, the researchers did not avail themselves of the majority of strategies in the TTM. No reminders were made of the driver's personal responsibility for the current predicament. Direct advice was not provided and there was no hint of empathy or an attempt to strengthen self-efficacy. Of the early-stage techniques, environmental reevaluation, social liberation and self-reevaluation appeals were not utilized. The researchers did not employ four of the five late-stage strategies including stimulus control, helping relationships, counter conditioning, and self-liberation.

The six month results found a significant difference ($F [1, 7741] = 5.57, p < .02$) between the two groups, with probation-by-mail subjects accumulating 8% more convictions plus failures-to-appear. No significant finding between the two groups were discovered either for total accidents or fatal and injury accidents.

Marsh (1985-1995)

RATINGS (Averages 1985-1995):

(See Table 2 for individual year details.)

Design Quality: 23.33

Regular Warning Letter: 11.3/33

Alcohol Warning Letter: 12.3/33

Regular Notice of Intent to Suspend: 10.7/33

Alcohol Notice of Intent to Suspend: 8.5/33

William C. Marsh is well recognized for his seminal research work on negligent operator treatment evaluation for the Research and Development Branch of the California Department of Motor Vehicles. Mr. Marsh produced negligent operator treatment Program Effectiveness Reports beginning in December 1985 and ending with Program Effectiveness Report Number 7 in May 1995 (Marsh & Kadell, 1985; Marsh 1986, 1987, 1988, 1992; and Marsh & Healy, 1995).

Literally all his research received maximum scores for design characteristics, which included no-contact control groups, participation rates in excess of 70 percent, random assignment to treatment conditions, similar subject characteristics, and temporality. No other single researcher in the long history of postlicensing control programs has compiled a body of research that compares to the contribution Marsh has made to traffic safety.

The Negligent Operator Treatment Evaluation System (NOTES) provided a basis for comparing the driver records of negligent drivers, randomly assigned either to a treatment or control condition. Drivers in the treatment group received the negligent operator interventions appropriate to their point count, while those in the control group were not contacted. Although the NOTES program evaluated treatments at three levels—warning letters, notice of intent to suspend, and probation hearing—this review is focused on the first two levels, because they contained “letter treatments”.

In 1985, Marsh found that the number of convicted drivers fell by 10.2 % as a result of the level-1 treatment and 9.9% due to the level-2 intervention. Both results would be expected to occur by chance in less than one out of 100 samples, if there were no real treatment effects. No attempt was made in 1985 to evaluate the treatment effects on accidents due to the small sample sizes and short follow-up period of six months.

In 1986, significant results in convicted drivers were again identified at the first two treatment levels, although only short-term, non-significant, positive results were found for accidents at those levels.

Again, in 1987, significant reductions in convicted drivers were associated with both the warning and intent letters. Furthermore, when the results for the warning letters and notices of intent were combined, they produced a statistically significant reduction in accidents, although that result was not identified with either treatment separately.

The 1988 results for convictions were similar to those reported in earlier NOTES reports. Both the warning letter and the notice of intent were responsible for statistically significant ($p = 0.0001$) reductions in convicted drivers over the six-month follow-up period. Neither of the two letter treatments were found, individually, to be associated with a reduction in accidents, although the level-1 results were significant at the $p = 0.11$ level. The combined six-month results for the warning and intent letters demonstrated that drivers receiving the letters had significantly fewer accidents ($p < 0.09$) than drivers in the control group.

The results of the survival analysis in 1990 found that the warning letter significantly ($p < 0.0001$) reduced the number of convicted drivers, during the first six-months after treatment. The notice of intent produced even more positive results than the warning letter during the same follow-up time. The 1990 study also identified statistically significant ($p < 0.04$) differences in accident-free survival curves between controls and both the warning letter and notice of intent treatment groups at the end of a six-month follow-up period, with the letter groups showing fewer accidents.

In 1992, Marsh found that both level 1 and 2 treatments reduced the number of convicted drivers over a length of six-months after intervention. In each case there was less than 1 chance in 10,000 that a difference as large or larger than the one observed would have occurred if the intervention had no real effect. Concerning injury accidents, level 1 demonstrated statistically significant ($p < 0.09$) reductions at the six-month interval but the notice of intent letter did not.

Finally, in the last NOTES report (1995), both level 1 and 2 treatments produced statistically significant ($p < 0.0001$) reductions in convicted drivers. The warning letter intervention also accounted for significantly ($p < 0.05$) fewer accidents than controls during the first six months after treatment.

The primary function of the NOTES program was to provide decision makers with annual effectiveness data on the negligent operator treatment system. Unlike the McBride and Peck (1970) study, NOTES was not specifically designed to evaluate the details of the treatment letters themselves, although that form of intervention was used in each study of the series. As a result, the contents of the letters were not controlled during the sequence of evaluations. The consequence of the emphasis on cost-effectiveness was an inability to separate effective from ineffective treatment elements within the letters. Not only were different treatment letters used in separate studies, but also within the subject selection period for a single study. Therefore, it is conceivable that subjects in a particular cohort received one of six or more treatment letters depending upon the day their letter was issued (Appendix A-6). At least three versions of the treatment letters are known to have been issued during the relatively short subject selection period attendant to the 1995 study. Apparently, administrative demands as well as research needs dictated changes in the letters' wording or emphasis.

Nevertheless, treatment letters (Appendices B-18 to B-29) for the decade beginning in 1985 were located and analyzed with respect to the TTM elements. To address the uncertainty regarding the specific time periods that each treatment letter was used, treatment letter quality ratings were averaged (Table 1) across the Marsh studies (1985-1995).

All the treatments contained systematic feedback and consciousness-raising components but none provided a choice of strategies or stressed social liberation, stimulus control, counter conditioning, contingency management, or self-liberation.

Researchers used the balance of the sixteen general, early and late stage elements, but with varying frequencies. Direct advice was used in 46 percent of the studies, 50 percent provided dramatic relief, and 33 percent made an attempt to strengthen self-efficacy.

Only 29 percent expressed empathy, 25 percent attempted to use environmental reevaluation, an astonishingly low 17 percent stressed personal responsibility or encouraged self-reevaluation, and a mere 13 percent offered help.

Compared with the balance of the studies, the treatment letters used by Marsh (1985-1995), on average, employed fewer general, early, and late stage elements (personal responsibility, choice of strategy, express empathy, strengthen self efficacy, dramatic relief, environmental reevaluation, helping relationships, and contingency management).

Jones (1997)

RATINGS:

Design Quality: 20/24

Standard Letter: 7/33

Soft-Sell Letter: 23/33

The Jones article reported on an evaluation of the Oregon Driver Improvement Program that monitors driver records and implements corrective treatments at various levels of negligent driving behavior. The author's focus was upon the effectiveness of a soft-sell warning letter as a countermeasure to negligent driving. Jones was motivated to initiate the study by his knowledge that much of the research into the effectiveness of low-threat warning letters was, by then, more than a quarter century old.

A total of 8,462 eligible drivers were selected for this study and 4,278 received the soft-sell, experimental letter, while the balance was mailed the Department's standard warning letter. Those in both treatment conditions and the no-contact control group, which consisted of 456 eligible drivers, were monitored for 26-38 subsequent months to determine the traffic safety implications of the letters.

For older drivers, both letters were effective treatments relative to accident and major conviction reductions, with the soft-sell letter being the more effective, although neither was found to be more effective than the control condition. The risk of moving violations does not appear to be affected by either letter, regardless of age or gender. However, for younger drivers, accident free survival was significantly poorer for both letter groups. Generally, the warning letters, especially the soft-sell letter, were effective with drivers at least 35 years old, but for drivers 25 and under, doing nothing resulted in a significantly better result than sending either letter.

Oregon's standard (Appendix B-30) and soft-sell letters (Appendix B-31) are very different in their use of some TTM components but identical in others. The standard letter (Table 12) utilized systematic feedback from the general change elements, consciousness-raising from the early stage techniques, and helping relationships and contingency management from the late stage methods. Only 25 percent of the available methods were used in the standard letter.

Table 12

Jones, 1997: Standard Letter

Design Characteristics	Score	General stage	Score	Early stage	Score	Late stage	Score
Participation rate 70%	4	Systematic feedback	3	Consciousness raising	2	Stimulus control	0
No-treatment control	4	Personal responsibility	0	Dramatic relief	0	Helping relationships	1
Random assignment	4	Direct advice	0	Environmental reevaluation	0	Counter conditioning	0
Similar subject characteristics	0	Choice of strategy	0	Social liberation	0	Contingency management	1
Blinded to random schedule	4	Express empathy	0	Self reevaluation	0	Self liberation	0
Temporality	4	Strengthen self-efficacy	0				
Total	20		3		2		2

Alternatively, the author availed himself of fifty-six percent of the sixteen TTM elements in the construction of the soft-sell treatment. However, six of the nine methods used were taken from one area, the general elements common to any effort to change behaviors. They create an environment conducive to change. Conversely, only two of the early stage and one of the late stage techniques were exploited.

Oregon's soft-sell letter (Table 13) performed commendably in setting the tone for change but did little to address the drivers' current stage of change. Early stage methods are essential for those drivers who may not be thinking about change or are ambivalent toward abandoning the status quo. Late stage techniques reinforce the driver who is committed to change but needs support to avoid relapse into earlier behaviors.

Table 13

Jones, 1997: Soft Sell Letter

Design Characteristics	Score	General stage	Score	Early stage	Score	Late stage	Score
Participation rate 70%	4	Systematic feedback	3	Consciousness raising	2	Stimulus control	0
No-treatment control	4	Personal responsibility	3	Dramatic relief	2	Helping relationships	1
Random assignment	4	Direct advice	3	Environmental reevaluation	0	Counter conditioning	0
Similar subject characteristics	0	Choice of strategy	3	Social liberation	0	Contingency management	0
Blinded to random schedule	4	Express empathy	3	Self reevaluation	0	Self liberation	0
Temporality	4	Strengthen self-efficacy	3				
Total	20		18		4		1

DISCUSSION

Fifty years of traffic safety research has established the efficacy and efficiency of exploiting the power of language to regulate the behaviors of negligent drivers (Campbell, 1959; Kaestner, et al., 1965; McBride & Peck, 1970; Epperson & Harano, 1975 and, Jones, 1997).

Although traffic safety researchers have been identifying components necessary, if not sufficient, for an effective warning letter (Campbell, 1959; Kaestner et al., 1965; McBride & Peck, 1970; Epperson & Harano, 1975; Ayers, 1980; Li, 1980; and, Jones, 1997) for a half century, Hayes' (1969) comment about warning letter improvement being an art, not a science, is apparently still true today. The important contributions of the aforementioned researchers notwithstanding, the positive traffic safety results associated with warning letters arguably result from strong research designs and, to a lesser degree, official contact from a regulatory agency, not from the specific contents of the letter.

McBride & Peck (1970) and Jones (1997) demonstrated the potential that warning letters promise under controlled conditions but institutionalized negligent operator treatment and evaluation systems operate quite differently. In California, the Negligent Operator Treatment and Evaluation System (NOTES) was fortunate to have been managed by a top echelon researcher who designed an experimental research protocol that included randomization, no-contact controls, and temporality. From 1985 to 1995, Marsh demonstrated the cost effectiveness of the NOTES program in spite of the fact that the contents of many warning letters were weak and the issuance of new warning letters with different contents was not coordinated with the research agenda (Appendix A-6). In a quasi-experimental environment, strong treatment letters and control over changes in and issuance of warning letters will become paramount considerations.

The contents of past warning letters used in NOTES were changed quite frequently, at times more than once per year. Individual negligent drivers within one study period may have received one of six or more different warning letters issued over the subject selection period. Nevertheless, the strength of the research design was usually sufficient to detect differences due to the official contact made by the Department of Motor Vehicles with the negligent driver. Unfortunately, it is impossible to tease-out the effects associated with the individual letters.

Regrettably, California's NOTES program was terminated in November 1994 after the Department of Motor Vehicles ended the use of untreated control groups, thereby eliminating the ability to conduct rigorous experimental research (Marsh & Healey, 1995). Researchers felt that under this policy NOTES quality would be compromised to such an unacceptable extent that research results could become unreliable.

In 2001, an effort began to look critically at the content of warning letters to determine the feasibility of developing a method both to evaluate the relative strength of a broad sample of warning letters and to identify a method to strengthen their effectiveness. More powerful treatments were thought to be an essential component of an enhanced negligent operator treatment and evaluation system (ENOTES) that would need to be operationalized in a quasi-experimental environment.

A review of the literature exposed a rich history of ideas traffic safety professionals had expressed to improve the effectiveness of warning letters. McBride and Peck (1970) advocated systematic feedback, intimacy, empathy and contingency management to enhance the content of warning letters. Li (1980) recommended the inclusion of a statement reinforcing the importance of personal responsibility, and also noted the need to raise the consciousness of negligent drivers. Carpenter and Peck (1980) offered choice in their probation by mail study. Ayers (1980) concurred with the need to express empathy as a means to motivate the drivers to accept the message contained in the warning letter. Kaestner et al. (1965) thought it was important to make an attempt to strengthen the driver's sense of self-efficacy. Epperson and Harano (1975) recognized the necessity of providing information regarding the nature and risk of unsafe driving behaviors. And, Campbell (1959) recommended the use of contingency management.

Warning letters are not new; Michigan, for instance, has been issuing them since 1940 (Hayes, 1969). What has been missing is a theory or model of behavior change that incorporates the observations of past traffic safety professionals with current knowledge generated from studies conducted within the field of transformational psychology.

The Transtheoretical Model (TTM) of change (Prochaska & DiClemente, 1982, 1984) satisfies these requirements and, in addition, provides results from a research agenda that has steadfastly evaluated the effectiveness of the theory's elements. Over the past half-century, traffic safety researchers independently identified 11 of the 16 general, early, and late stage strategies as important components to be included in advisory letters. These 16 TTM elements provided a standard basis for evaluating the quality of the warning letters reviewed for this report.

The factored total quality scores for the 42 treatment letters demonstrate the fact that traffic safety researchers were not guided by a single theory of change (Appendix A-4). The Epperson et al. (1974) low threat/high intimacy letter earned the highest factor score, 44 of 57. Jones (1997) achieved a similar score of 43 for the "soft-sell" letter. Interestingly, Jones' standard treatment letter ranked 37th, having scored only 27 points out of a possible 57. The Epperson et al. (1974), Jones (1997) and McBride and Peck (1970) studies all demonstrate that the soft-sell or intimacy component of a treatment is a reflection of the number and type of TTM elements incorporated into the communication. For instance, Jones' soft-sell letter scored 18 for its use of General elements while the standard letter scored 3.

The letters composed by McBride and Peck were similarly differentiated between the highly scored low threat letters and the other two. Obviously, a major part of what these authors refer to as threat and intimacy are represented in the General elements of the TTM.

There also appears to be a relationship between the General elements of the TTM and the components of communications theory. It is probably not coincidental that the five letter treatments that used the largest number of General elements (Appendix A-7) were all developed from communications theory. In addition, the sixth study (Marsh, 1969)

was generated in the same shop and at the same time that McBride and Peck (1970) were developing a scientifically composed letter treatment from communications theory.

However, the theory used by Jones (1997) and McBride and Peck (1970) to create their treatment letters did not utilize many of the Early Stage elements (Appendix A-8). For instance, the Jones letter that scored first in the use of General Stage methods fell to tenth place in the use of Early Stage elements. McBride and Peck used one additional Early Stage element in their low-threat letters than Jones applied to the soft-sell letter, but that was still only half the number of General Stage elements they utilized.

Overall, the 42 letter treatments used, on average, 2.5 of six General Stage elements, 1.8 of five Early Stage methods, and 0.29 of five Late Stage techniques. However, the various letters had a range of 1 to 6 General Stage elements, 0-4 Early Stage methods, and 0 to 2 Late Stage techniques. Although the Early Stage methods were clearly underutilized, the Late Stage techniques were all but ignored. No balanced treatment letters were identified that used the majority of the elements available from all three stages.

As with any new approach to an old problem, this review suffered from several limitations. One constraint was the difficulty encountered in locating ageing warning letters. The California Department of Motor Vehicles does not retain copies of old letters, other than those collected and maintained by the Research and Development Branch (R&D). Regrettably, some of the retained warning letters are undated, making it impossible to determine the study in which they were used.

The opportunity to study the longitudinal warning letter data generated through the California NOTES program for the decade beginning in 1985 and ending with the 1995 report was lost due to the failure to control the modification and dissemination of those treatment letters. At this point, looking backwards, it is obvious that individual members of a treatment cohort received different interventions but, since some archived letters are not dated and others were changed during the subject selection period, it is not possible to determine who received what treatments.

The evaluation of the treatment letters generated other concerns. Originally, a five-point, goal attainment scale (GAS) was developed to evaluate the quality of the warning letters in terms of the 16 TTM elements. However, the contents of the sentences did not support the level of detail required in a five-point metric (-2 to +2). Although the scale was later reduced to a more appropriate three-point GAS, two additional difficulties arose. The first involves the translation of the meanings of the 16 TTM terms to the actual words and sentences in the treatment letters. It was a more complex task than originally anticipated and should have been preceded by a lengthy period of training through practice. As experience with this assessment tool mounted, it became obvious that more TTM elements were being identified in the later letters than in the earlier ones. The length of the learning curve generated a recurring need to revisit and reassess previously evaluated treatment letters.

The second difficulty involves reliability. The three points on the GAS scale need to be anchored to a set of definitions or each element attached to a labeled, semantic

differential scale to ensure more reliable scoring. Currently, the scoring is too idiosyncratic.

Conclusions

This study draws a distinction between treatment effects noted in the studies designed to assess the associations between treatment letters and outcome measures (McBride & Peck, 1970) and those effects recorded in the course of an institutionalized NOTES program such as the seven reports Marsh produced between 1985 and 1995.

Jones (1997), referring to the results of his studies, as well as those by Kaestner, et al. (1965) and McBride and Peck (1970), reported, "One of the most well-established and useful principles in the regulation of problem drivers is that driver improvement letters work; and personalized, low threat letters work better than high threat, impersonal letters." Indeed, the McBride and Peck study confirmed the intuitions traffic safety professionals expressed regarding the potential that letter treatments held for driver improvement.

Nevertheless, Jones' observation and McBride and Peck's conclusions have more to say about the need for further research into the components that explain why letters are effective, than about the conduct and results of institutionalized negligent operator programs, such as the Marsh (1985-1995) studies. In that series, the researcher appears to have been denied control over the modification and distribution of the treatment letters. Archived letters with different contents are dated in the same year. Six, or more, different letters were issued during the subject selection period for at least one study. And, every study in the entire series of evaluations appears to have contained two or more treatment letters. No documentation was found to indicate the dates on which new letters were substituted for old. Obviously, no single treatment or combination of treatments can be identified as being responsible for the significant effects.

Therefore, it is reasonable to assume that any contact from a traffic safety regulatory agency will produce positive effects, given the strong research designs that characterized Marsh's (1985-1995) research. However, McBride and Peck (1970) have shown that stronger effects can be expected if a research program is initiated to increase the quality of the treatment letters.

The TTM is a theory of change that incorporates most of the recommendations that traffic safety researchers have been recommending over a period of 50 years. While the TTM was developed independent of the traffic safety field, it addresses issues that are common to traffic safety. In addition, it has been used extensively and has been successfully validated with recalcitrant populations to address problems once thought to be immutable. It likely would be a useful model to guide the development of an enhanced negligent operator treatment and evaluation system.

Recommendations

1. A negligent operator treatment and evaluation system, with an enhanced component designed to conduct ongoing research into the effective elements of

treatment letters, should be reinstituted to provide regular program and cost effectiveness data to the Department's decision makers. The enhanced component should be guided both by the TTM and the research results emanating from that model.

2. A no-contact control condition should be approved so that true experimental research can be conducted. Smaller control groups and/or allowing one additional point to accumulate before drivers are removed from the no-contact condition should be considered as means to address the concerns of management.
3. A survey of negligent operators should be conducted in order to determine the stage of change occupied by drivers in the first three levels of the NOTES program. In the past, drivers at levels one and two received either a standard or alcohol treatment level. However, according to TTM theory, all change makers pass through the same stages, meaning one appropriately worded letter should appeal to both, equally. The more relevant issue is the stage of change the driver occupies at the time the treatment letter is received.
4. A study should be initiated to determine if a driver's stage of change at the time of assignment to treatment can be predicted from information contained on the driver's record.
5. A pilot study should be authorized to compare the subsequent convictions and crashes of negligent operators receiving the regular probation hearing or an alternative probation-by-mail sanction based upon the TTM. As early as 1970, McBride and Peck recognized that the rapid delivery of an effective letter intervention could prevent the need for a more costly meeting between the negligent-operator and the department.
6. A treatment letter should be issued when the driver receives one negligent operator point in order to address the transitory issue (McBride & Peck, 1970), which acknowledges the fact that most accidents involve previously accident-free drivers. This treatment would be based upon the TTM and directed toward accident prevention.
7. The Department should maintain an archive of negligent operator treatment letters together with information detailing changes to the letters, times of the changes, and dates the letters were retired or replaced. Without this information, it is impossible to determine which treatments or treatment elements accounted for the results found.
8. R&D should be consulted before Departmental changes are made to the contents and distribution of advisory letters when the effects of those letters are being evaluated.

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Appendix A

Appendix A-1

Study:

Author:

Source:

Date:

Design:

Design Characteristics	Points X 4	General stage strategies	Points X 3				Early stage strategies	Points X 2				Late stage strategies	Points X 1			
			T1	T2	T3	T4		T1	T2	T3	T4		T1	T2	T3	T4
Participation rate 70%		Systematic feedback					Consciousness raising					Stimulus control				
No-treatment control		Personal responsibility					Dramatic relief					Helping relationships				
Random assignment		Direct advice					Environmental reevaluation					Counter conditioning				
Similar subject characteristics		Choice of strategy					Social liberation					Contingency management				
Blinded to random schedule		Express empathy					Self reevaluation					Self liberation				
Temporality		Strengthen self-efficacy														
Total																
Strengthen of associations																

OTHER FACTORS:

T1, T2, T3, AND T4 = Treatment letters used

General, Early, and Late stages taken from the transtheoretical model.

Appendix A-2

Summary Sheet for Factored Total Quality-Scores

[illegible]

Appendix A-3

Transtheoretical Model Vs. Traffic Safety Researchers' Recommendations

GENERAL ELEMENTS

1. SYSTEMATIC FEEDBACK (GE): Provide clear knowledge of the present situation for change to occur.	The letters should include a summary of previous convictions (McBride, 1981). More than one contact should be instituted Weidman, et al., (1982).
2. PERSONAL RESPONSIBILITY (GE): Stresses the drivers personal responsibility for change. This can be achieved either explicitly (directly stated) or implicitly (pamphlet).	The content of the letters should stress the driver's responsibility for improving their driving (Li, 1980).
3. PROVIDE DIRECT ADVICE (GE): Provides relevant advice with the caveat that the choice is the negligent-drivers.	Marsh (1965) promoted the act of offering direct advice to negligent operators.
4. OFFER CHOICE OF STRATEGIES (GE): Makes use of the knowledge that intrinsic motivation is enhanced by the perception that the negligent-operator has freely chosen a course of action (menu of choices).	Under PBM, letter offers choice to accept probation or attend an individual hearing (Carpenter and Peck, 1980).
5. EXPRESS EMPATHY (GE): Communicates great respect for the driver as a person. The letter is a blend of supportive companion and knowledgeable consultant. The driver's freedom of choice and self-direction are respected because it is recognized that only the negligent-operator who can choose to change and carry out that choice.	Low and moderate threat (standard) appeal were more effective than the high threat appeals in reducing accidents (McBride and Peck, 1970). Behavior Analysis program used a more nondirective approach encouraging class participation and stimulating it own formulation of answers to traffic safety (Ayers, 1980)
6. STRENGTHEN SELF-EFFICACY (GE): Communicates confidence in the ability of the driver to make changes across problem situations.	In general, the soft sell letter emphasizing encouragement showed the largest reductions in violations and collisions, although just personalizing the standard letter improved its effectiveness (Kaestner et al., 1965).

EARLY STAGES

1. CONSCIOUSNESS RAISING (ES): Involves providing information regarding the nature and risk of unsafe behaviors and the value and drawbacks of the safer behavioral alternatives.	Inclusion of an informational pamphlet along with driver improvement letters improved effectiveness of the mailing (Epperson and Harano, 1975). Warning letters should consider the possibility of incorporating some safety information (Li, 1980)
2. DRAMATIC RELIEF (ES): Fosters the identification, experiencing, and expression of emotions related to the risk and the safer alternatives in order to work toward adaptive strategies.	Kaestner et al. (1965) found that leaving negligent operators in a state of threat and fear arousal will trigger resistance.

Appendix A-3 (continued)

EARLY STAGES - continued

3. ENVIRONMENTAL REEVALUATION (ES): Allows the individual to reflect on the consequences of his or her behavior for other people. It can include reconsideration of perceptions of social norms and the opinions of people important to the negligent-driver.	The content of the letters should stress the consequences (such as endangering self and others) of negligent driving (Li, 1981).
4. SOCIAL LIBERATION (ES): Helps the individual to understand that the social norms are changing in the direction of supporting the healthy behavioral change.	No reference
5. SELF-REEVALUATION (LS): Helps the individual to realize that the behavioral change is an important part of one's identity as a person.	No reference

LATE STAGES

1. STIMULUS CONTROL (LS): Helps remove reminders or cues to engage in the unhealthy behavior and adding cues or reminders to engage in the healthy behavior.	No reference
2. HELPING RELATIONSHIPS (LS): Promotes seeking and using social support for the healthy behavioral change.	Kaestner, et al. (1965) emphasized the need for the DMV to provide assistance to drivers receiving warning letters.
3. COUNTER CONDITIONING (LS): Substitutes healthier alternative behaviors and cognitions for the unhealthy behavior.	No reference
4. CONTINGENCY MANAGEMENT (LS): Increases the rewards for the positive behavioral change and decreasing the rewards of the unhealthy behavior.	<p>Further research should be directed toward developing new reinforcement strategies (McBride and Peck, 1970).</p> <p>Also worth study is the idea of a follow-up letter which is , in effect, a commendation (Campbell 1959).</p> <p>These results suggest that initial letter contacts which use an incentive strategy may be a more effective approach than traditional warning letter programs (Epperson and Harano, 1975)</p>
5. SELF-LIBERATION (ES): Fosters a firm commitment to change. Use decisional balance concepts.	No reference

Appendix A-4

Factored Total Quality-Scores For Study Designs Plus Treatments

Study	Year	Treatment	Design Quality Factor = 4	General Quality Factor = 3	Early Quality Factor = 2	Late Quality Factor = 1	Factored Total Score
Epperson et al.	1974	LT/HI	20	18	6	0	44
Jones	1997	Soft-Sell	20	18	4	1	43
McBride/Peck	1970	LT/LI	16	18	6	0	40
McBride/Peck	1970	LT/HI	16	18	6	0	40
Marsh	1995	L2 Alcohol	20	9	8	1	38
Marsh	1988	L1 Alcohol	24	9	4	0	37
Marsh	1987	L1 Alcohol	24	9	4	0	37
Marsh	1986	L1 Alcohol	24	9	4	0	37
Marsh/Kadell	1985	L1 Alcohol	24	9	4	0	37
Kaestner et al.	1965	Soft-Sell	20	12	4	1	37
Marsh	1995	L1 Standard	20	9	6	1	36
Marsh	1995	L2 Standard	20	9	6	1	36
Marsh	1988	L1 Standard	24	9	2	0	35
Marsh	1987	L1 Standard	24	9	2	0	35
Marsh	1986	L1 Standard	24	9	2	0	35
Marsh/Kadell	1985	L1 Standard	24	9	2	0	35
Epperson et al.	1974	Pamphlet	20	9	6	0	35
Marsh	1995	L1 Alcohol	20	6	8	0	34
Marsh	1988	L2 Standard	24	6	4	0	34
Marsh	1987	L2 Standard	24	6	4	0	34
Marsh	1986	L2 Standard	24	6	4	0	34
Marsh/Kadell	1985	L2 Standard	24	6	4	0	34
McBride/Peck	1970	HT/HI	16	12	6	0	34
Kaestner et al.	1965	Standard	20	9	4	0	33
Kaestner et al.	1965	Standard/Personalized	20	9	4	0	33
Marsh	1992	L1 Standard	24	6	2	0	32
Marsh	1992	L1 Alcohol	24	6	2	0	32
Marsh	1992	L2 Standard	24	6	2	0	32
Marsh	1969	Warning Letter	16	12	4	0	32
Marsh	1988	L2 Alcohol	24	3	4	0	31
Marsh	1987	L2 Alcohol	24	3	4	0	31
Marsh	1986	L2 Alcohol	24	3	4	0	31
Marsh/Kadell	1985	L2 Alcohol	24	3	4	0	31
Marsh	1992	L2 Alcohol	24	3	2	0	29
Jones	1997	Standard	20	3	2	2	27
Epperson et al.	1974	Reinforcement	20	6	0	1	27
Epperson et al.	1974	Standard	20	3	2	1	26
McBride/Peck	1970	HT/LI	16	6	4	0	26
Sherman/Ratz	1979	Probation/Mail	12	6	4	1	23
Sherman/Ratz	1979	Notice of Hearing	12	6	4	1	23
Kaestner et al.	1975	Last Chance W/L	12	6	4	0	22
McBride/Peck	1970	Standard	16	3	2	1	22

Appendix A-5

Comparison Of Similar Treatment Letters

EPPERSON & HARANO (1974)	McBRIDE & PECK (1970)
<ol style="list-style-type: none"> 1. Your case has been given to me as part of my special caseload of violation repeaters. 2. My review of your record indicates that you have been convicted on several occasions of violations of the traffic laws. 3. Since you are very close to the legal definition of a negligent driver, I must make a recommendation to the Department as to what we should do about you. 4. I know from personal experience that many drivers with records like yours are a danger to themselves, their loved ones, and their community. 5. I also urge you to consider the financial drain caused by traffic fines, insurance rate increases and accidents. 6. Is it really worth it? 7. I am sure you must realize the important responsibility which the Department and I have to keep unsafe drivers off our highways. 8. I am counting on you to show me that you can drive in a safe, responsible manner. 9. I will personally check your record for improvement to determine if further action is necessary. 10. I have found that drivers like you can improve if they really try. 11. But remember, the time for your improvement is now – not later. 	<ol style="list-style-type: none"> 1. Because of your driving record during the past 12 months, your case has been given to me as part of my special driver improvement caseload. 2. My review of your record indicates that during the past year you have been convicted on several occasions of violations of the traffic laws. 3. Since you are very close to the legal definition of a negligent driver, I must make a recommendation to the Department as to what we should do about you. 4. I know from years of experience that some drivers with records like yours are a danger to themselves, their loved ones, and their community. 5. In addition, there is always the danger of financial loss. 6. I am sure you must realize the important responsibility which the Department and I have to keep unsafe drivers off our highways. 7. I am counting on you to show me that you can drive in a safe, responsible manner. 8. I will personally check your record for improvement to determine if further action is necessary. 9. It has been my experience that drivers like you can improve if they really try. 10. Remember, now is the time for you to improve your driving – not later.

Appendix A-6

Data Collection Periods, Marsh NOTES Studies

	1985	1986	1987	1988	1990	1992	1995
Year Quarter	1/8/85 – 8/5/85	1/8/85 – 5/27/86	1/8/85 – 5/18/87	1/8/85 – 5/18/87	1/8/85 – 3/6/90	1/8/85 – 6/27/92	5/3/91 – 12/31/94
<u>1985</u>	*	*	*	*	*	*	
2 nd	*	*	*	*	*	*	
3 rd	*	*	*	*	*	*	
4 th		*	*	*	*	*	
<u>1986</u>		*	*	*	*	*	
2 nd		*	*	*	*	*	
3 rd			*	*	*	*	
4 th			*	*	*	*	
<u>1987</u>			*	*	*	*	
2 nd			*	*	*	*	
3 rd					*	*	
4 th					*	*	
<u>1988</u>					*	*	
2 nd					*	*	
3 rd					*	*	
4 th					*	*	
<u>1989</u>					*	*	
2 nd					*	*	
3 rd					*	*	
4 th					*	*	
<u>1990</u>					*	*	
2 nd						*	
3 rd						*	
4 th						*	
<u>1991</u>						*	
2 nd						*	*
3 rd						*	*
4 th						*	*
<u>1992</u>						*	*
2 nd						*	*
3 rd							*
4 th							*
<u>1993</u>							*
2 nd							*
3 rd							*
4 th							*
<u>1994</u>							*
2 nd							*
3 rd							*
4 th							*

Appendix A-7

Factored Total Quality-Scores Sorted by General Element Quality

Study	Year	Treatment	Design Quality Factor = 4	General Quality Factor = 3	Early Quality Factor = 2	Late Quality Factor = 1	Factored Total Score
Jones	1997	Soft-Sell	20	18	4	1	43
Epperson et al.	1974	LT/HI	20	18	6	0	44
McBride/Peck	1970	LT/LI	16	18	6	0	40
McBride/Peck	1970	LT/HI	16	18	6	0	40
McBride/Peck	1970	HT/HI	16	12	6	0	34
Marsh	1969	Warning Letter	16	12	4	0	32
Kaestner et al.	1965	Soft-Sell	20	12	4	1	37
Marsh	1995	L2 Alcohol	20	9	8	1	38
Marsh	1995	L1 Standard	20	9	6	1	36
Marsh	1995	L2 Standard	20	9	6	1	36
Marsh	1988	L1 Alcohol	24	9	4	0	37
Marsh	1988	L1 Standard	24	9	2	0	35
Marsh	1987	L1 Alcohol	24	9	4	0	37
Marsh	1987	L1 Standard	24	9	2	0	35
Marsh	1986	L1 Alcohol	24	9	4	0	37
Marsh	1986	L1 Standard	24	9	2	0	35
Marsh/Kadell	1985	L1 Alcohol	24	9	4	0	37
Marsh/Kadell	1985	L1 Standard	24	9	2	0	35
Epperson et al.	1974	Pamphlet	20	9	6	0	35
Kaestner et al.	1965	Standard	20	9	4	0	33
Kaestner et al.	1965	Standard/Personalized	20	9	4	0	33
Marsh	1995	L1 Alcohol	20	6	8	0	34
Marsh	1992	L1 Standard	24	6	2	0	32
Marsh	1992	L1 Alcohol	24	6	2	0	32
Marsh	1992	L2 Standard	24	6	2	0	32
Marsh	1988	L2 Standard	24	6	4	0	34
Marsh	1987	L2 Standard	24	6	4	0	34
Marsh	1986	L2 Standard	24	6	4	0	34
Marsh/Kadell	1985	L2 Standard	24	6	4	0	34
Sherman/Ratz	1979	Probation/Mail	12	6	4	1	23
Sherman/Ratz	1979	Notice of Hearing	12	6	4	1	23
Kaestner et al.	1975	Last Chance W/L	12	6	4	0	22
Epperson et al.	1974	Reinforcement	20	6	0	1	27
McBride/Peck	1970	HT/LI	16	6	4	0	26
Jones	1997	Standard	20	3	2	2	27
Marsh	1992	L2 Alcohol	24	3	2	0	29
Marsh	1988	L2 Alcohol	24	3	4	0	31
Marsh	1987	L2 Alcohol	24	3	4	0	31
Marsh	1986	L2 Alcohol	24	3	4	0	31
Marsh/Kadell	1985	L2 Alcohol	24	3	4	0	31
Epperson et al.	1974	Standard	20	3	2	1	26
McBride/Peck	1970	Standard	16	3	2	1	22

Appendix A-8

Factored Total Quality-Scores Sorted by Early Element Quality

Study	Year	Treatment	Design Quality Factor = 4	General Quality Factor = 3	Early Quality Factor = 2	Late Quality Factor = 1	Factored Total Score
Marsh	1995	L2 Alcohol	20	9	8	1	38
Marsh	1995	L1 Alcohol	20	6	8	0	34
Marsh	1995	L1 Standard	20	9	6	1	36
Marsh	1995	L2 Standard	20	9	6	1	36
Epperson et al.	1974	LT/HI	20	18	6	0	44
Epperson et al.	1974	Pamphlet	20	9	6	0	35
McBride/Peck	1970	LT/LI	16	18	6	0	40
McBride/Peck	1970	LT/HI	16	18	6	0	40
McBride/Peck	1970	HT/HI	16	12	6	0	34
Jones	1997	Soft-Sell	20	18	4	1	43
Marsh	1988	L1 Alcohol	24	9	4	0	37
Marsh	1988	L2 Standard	24	6	4	0	34
Marsh	1988	L2 Alcohol	24	3	4	0	31
Marsh	1987	L1 Alcohol	24	9	4	0	37
Marsh	1987	L2 Standard	24	6	4	0	34
Marsh	1987	L2 Alcohol	24	3	4	0	31
Marsh	1986	L1 Alcohol	24	9	4	0	37
Marsh	1986	L2 Standard	24	6	4	0	34
Marsh	1986	L2 Alcohol	24	3	4	0	31
Marsh/Kadell	1985	L1 Alcohol	24	9	4	0	37
Marsh/Kadell	1985	L2 Standard	24	6	4	0	34
Marsh/Kadell	1985	L2 Alcohol	24	3	4	0	31
Sherman/Ratz	1979	Probation/Mail	12	6	4	1	23
Sherman/Ratz	1979	Notice of Hearing	12	6	4	1	23
Kaestner et al.	1975	Last Chance W/L	12	6	4	0	22
McBride/Peck	1970	HT/LI	16	6	4	0	26
Marsh	1969	Warning Letter	16	12	4	0	32
Kaestner et al.	1965	Soft-Sell	20	12	4	1	37
Kaestner et al.	1965	Standard	20	9	4	0	33
Kaestner et al.	1965	Standard/Personalized	20	9	4	0	33
Jones	1997	Standard	20	3	2	2	27
Marsh	1992	L1 Standard	24	6	2	0	32
Marsh	1992	L1 Alcohol	24	6	2	0	32
Marsh	1992	L2 Standard	24	6	2	0	32
Marsh	1992	L2 Alcohol	24	3	2	0	29
Marsh	1988	L1 Standard	24	9	2	0	35
Marsh	1987	L1 Standard	24	9	2	0	35
Marsh	1986	L1 Standard	24	9	2	0	35
Marsh/Kadell	1985	L1 Standard	24	9	2	0	35
Epperson et al.	1974	Standard	20	3	2	1	26
McBride/Peck	1970	Standard	16	3	2	1	22
Epperson et al.	1974	Reinforcement	20	6	0	1	27

Appendix B

Appendix B-1

Kaestner, N., Warmoth, E. J., & Syring, E. M. (1965). *Oregon study of advisory letters: The effectiveness of warning letters in driver improvement*. Salem: Oregon Department of Motor Vehicles.

(Standard Letter)

Driver License No. 999999

The most recent entry on your driving record places you among a relatively small percentage of Oregon drivers who have been involved in driving troubles of various types two or more time during the past twelve months.

It is our hope that this letter will prompt you to review your driving habits and attitudes and that you will take steps to improve your driving. It also is our responsibility to inform you that further convictions or accidents may necessitate calling you to an interview with a Driver Improvement Analyst. Continued difficulty following the interview may lead to a license suspension.

The need for interview or suspension depends solely upon your future driving performance, and any new entries on your record will be subjected to careful evaluation of both the seriousness and frequency of violations and accidents before action is taken.

We believe you are a more capable driver than current records would indicate, and it is our hope that your true ability to drive will be reflected in an improved performance during the months ahead. Actually, we believe you will find that it doesn't require much effort for a qualified driver to improve to the extent that he can go violation and accident free year after year. One year of trouble free driving will remove your name from those receiving special attention. All we ask is your co-operation.

Very truly yours,

Appendix B-2

Kaestner, N., Warmoth, E. J., & Syring, E. M. (1965). *Oregon study of advisory letters: The effectiveness of warning letters in driver improvement*. Salem: Oregon Department of Motor Vehicles.

(Personalized Letter)

Dear Mr. Doe:

The most recent entry on your driving record places you among a relatively small percentage of Oregon drivers who have been involved in driving troubles of various types two or more time during the past twelve months.

It is our hope that this letter will prompt you to review your driving habits and attitudes and that you will take steps to improve your driving. It also is our responsibility to inform you that further convictions or accidents may necessitate calling you to an interview with a Driver Improvement Analyst. Continued difficulty following the interview may lead to a license suspension.

The need for interview or suspension depends solely upon your future driving performance, and any new entries on your record will be subjected to careful evaluation of both the seriousness and frequency of violations and accidents before action is taken.

We believe you are a more capable driver than current records would indicate, and it is our hope that your true ability to drive will be reflected in an improved performance during the months ahead. Actually, we believe you will find that it doesn't require much effort for a qualified driver to improve to the extent that he can go violation and accident free year after year. One year of trouble free driving will remove your name from those receiving special attention. All we ask is your co-operation.

Very truly your,

Appendix B-3

Kaestner, N., Warmoth, E. J., & Syring, E. M. (1965). *Oregon study of advisory letters: The effectiveness of warning letters in driver improvement*. Salem: Oregon Department of Motor Vehicles.

(Personalized Soft-Sell Letter)

Dear Mr. Doe:

You are now sharing the Oregon Highways with over a million drivers. To drive trouble free, under these conditions, it's basic that a driver remember and apply our traffic laws. The unintentional development of unsafe driving habits or attitudes may be just as serious as the purposeful disregard of the rules of the road.

We're writing to you because of the entries on your driving record the past twelve months. At the time your original Oregon driver's license was issued, you showed an adequate knowledge of our traffic laws. Also, your attitude toward driving and your driving ability during the road test were regarded as satisfactory. With that start, plus any additional skills you may have acquired since then, it seems reasonable to expect a better record.

One step in avoiding future difficulty is your recognition that possibly you're not devoting enough attention and effort to driving. If this reminder helps you to look for and correct possible weaknesses in your driving, it will have served its purpose and there will be no further action by our department. Should you desire information on safe driving practices or Oregon traffic laws, please write us.

Sincerely,

Appendix B-4

Marsh, W. C. (1969). *Modifying negligent driving behavior: A preliminary evaluation of selected driver improvement techniques*. Sacramento: California Department of Motor Vehicles.

(Warning Letter)

In reviewing your traffic record, we find that on several occasions you have violated traffic laws relating to the safe operation of motor vehicles. The California Vehicle Code contains the following definition.

“Any person whose driving record shows a violation point count of four or more points in 12 months, six or more points in 24 months, or eight or more points in 36 months shall be prima facie presumed to be a negligent operator of a motor vehicle.

Any accident in which the operator is deemed by the Department to be responsible shall be given a value of one point.”

This does not mean that a driver is “entitled” to receive any specific number of traffic citations within a given period without action by the Department, nor does it imply that the Department condones even one violation.

Your record is brought to your attention by this letter. If you continue to violate traffic laws and drive in a negligent or unsafe manner, you risk the suspension or revocation of your driving privilege.

Driving is a privilege not a right. When the safety of persons using the highways is jeopardized by unsafe driving, it becomes the duty of the State to take away such privilege. You will protect your driving privilege by complying with the traffic laws and by following safe driving practices.

No action is being taken in your case at this time for we believe that you can and will drive without further traffic law violations and thereby reduce the possibility of an accident in the future.

Always drive with the safety of yourself and others foremost in your mind:

Department of Motor Vehicles

Appendix B-5

McBride, R. S. & Peck, R. C. (1970). Modifying negligent driving behavior through warning letters. *Accident Analysis and Prevention*, 2, 141-174.

(Standard Letter)

WARNING

License No. _____

In reviewing your driver record, we find several entries relating to the unsafe operation of motor vehicles.

If you continue to violate traffic laws and drive in a negligent manner, you risk the possible loss of your driving privilege.

Attached is a pamphlet with important information for you. You can obtain a helpful summary of traffic laws at the Department of Motor Vehicles in your area.

Will you help us make our highways safer for yourself and others?

DEPARTMENT OF MOTOR VEHICLES

Appendix B-6

McBride, R. S. & Peck, R. C. (1970). Modifying negligent driving behavior through warning letters. *Accident Analysis and Prevention*, 2, 141-174.

(High Threat / High Intimacy)

WARNING

BECAUSE OF YOUR DRIVING DURING THE PAST YEAR, YOU ARE IN DANGER OF HAVING YOUR DRIVERS LICENSE TAKEN AWAY!

Your case has been referred to me as part of my special driver improvement caseload.

Your record shows that on several occasions during the past year, you have been convicted of hazardous violations of the traffic laws. Your record places you dangerously close to being classified as a negligent driver and I must study it and think about the possibility of withdrawing your license to drive.

At this moment, I am looking at fatal accident reports which clearly show that irresponsible driving patterns like yours cannot only cause financial disaster, but can cause you to be maimed, disfigured or even killed.

I am sure you know that the Department and I have a responsibility to keep reckless drivers off our highways. You must realize that your dangerous driving habits cannot –and will not–be allowed to continue, I know from years of experience that reckless drivers can improve if they try. Unless improvement occurs in your case, you will leave us with no choice other than to restrict or even withdraw your driving privilege.

Although I am recommending that no action be taken at this time, your record will be checked periodically to determine if we will have to withdraw your license. Remember, the action that will be taken depends on you!

Driver Record:
Violations-
Accidents

Sincerely yours,

Driver Improvement Analyst

Appendix B-7

McBride, R. S. & Peck, R. C. (1970). Modifying negligent driving behavior through warning letters. *Accident Analysis and Prevention*, 2, 141-174.

(High Threat / Low Intimacy)

License No. _____

Violations _____

Accidents _____

YOU ARE IN DANGER OF HAVING YOUR DRIVING PRIVILEGE WITHDRAWN!

During the past year you have on several occasions been convicted of hazardous violations of the traffic laws. This places you dangerously close to being categorized as a negligent operator in accordance with Section 12810 of the Vehicle Code. This section empowers – and in fact obligates – the Department of Motor Vehicles to utilize its discretionary authority in taking hazardous drivers off the streets and highways.

Statistics clearly indicate that irresponsible driving patterns such as yours often result in the maiming of innocent people and in destruction of human life. Thus we cannot – and will not – tolerate negligent and hazardous driving on the streets and highways of this state. Violation of traffic laws must cease or the Department will be forced to take harsh measures against your driving privilege. The revocation or even restriction of one's license can result in severe personal and economic disaster.

Your record will henceforth be placed in an action pending file and reviewed by the Department on a periodic basis to determine if restrictive measures will be necessary.

It is never too late to improve, but in your case, improvement must be immediate if restrictive action is to be avoided.

Department of Motor Vehicles
Division of Drivers Licenses

By _____

Appendix B-8

McBride, R. S. & Peck, R. C. (1970). Modifying negligent driving behavior through warning letters. *Accident Analysis and Prevention*, 2, 141-174.

(Low Threat / High Intimacy)

NOTICE

License No. _____

Because of your driving record during the past 12 months, your case has been given to me as part of my special driver improvement caseload. My review of your record indicates that during the past year you have been convicted on several occasions of violations of the traffic laws. Since you are very close to the legal definition of a negligent driver, I must make a recommendation to the Department as to what we should do about you.

I know from years of experience that some drivers with records like yours are a danger to themselves, their loved ones, and their community. In addition, there is always the danger of financial loss.

I am sure you must realize the important responsibility which the Department and I have to keep unsafe drivers off our highways. I am counting on you to show me that you can drive in a safe, responsible manner. I will personally check your record for improvement to determine if further action is necessary.

It has been my experience that drivers like you can improve if they really try. Remember, now is the time for you to improve your driving – not later.

DRIVER RECORD:

Violations –
Accidents –

Sincerely yours,

Driver Improvement Analyst

Appendix B-9

McBride, R. S. & Peck, R. C. (1970). Modifying negligent driving behavior through warning letters. *Accident Analysis and Prevention*, 2, 141-174.

(Low Threat / Low Intimacy)

License No. _____

Violations _____

Accidents _____

The Department of Motor Vehicles is reviewing the records of all drivers in danger of being classified as negligent operators in accordance with Section 12810 of the California Vehicle Code. This code permits the Department to utilize its discretionary authority in the interest of public safety.

During the past year you were convicted of several violations of the traffic laws which place you in danger of being legally classified as a negligent operator.

Statistics show that drivers who violate traffic laws frequently represent increased safety risks to themselves and to the public. In addition, continued traffic violations and/or accident involvement may result in economic inconvenience to yourself and to others.

The Department does not want to take restrictive measures and is confident that you will cease driving in an unsafe manner. Henceforth, your case will be reviewed on a periodic basis and any further action will depend upon your future driving performance.

The Department wishes to emphasize that the time for improvement is now – not later.

Department of Motor Vehicles
Division of Drivers Licenses

By _____

Appendix B-10

McBride, R. S. & Peck, R. C. (1970). Modifying negligent driving behavior through warning letters. *Accident Analysis and Prevention*, 2, 141-174.

(Reinforcement)

DRIVER RECORD PROGRESS REPORT

License No. _____

As of this date the Department's records indicate that you have not been involved in traffic citations or accidents since receiving our warning letter several months ago. Therefore, it is my pleasure to acknowledge this improvement in your driving record. It is indeed unfortunate that more drivers do not show a similar improvement. The Department will continue to review your record over the next six months for further evidence of progress. We hope that you will continue to drive safely and protect your driving privilege.

Sincerely,

Driver Improvement Analyst
Division of Drivers License

Appendix B-11

Epperson, W. V. and Harano, R. M. (1975). An evaluation of some additional factors influencing the effectiveness of warning letters. *Accident Analysis and Prevention* 7: 239-247.

(Standard Letter)

WARNING

License No. _____

In reviewing your driving record, we find several entries relating to the unsafe operation of motor vehicles.

If you continue to violate traffic laws and drive in a negligent manner, you risk the possible loss of your driving privilege.

You can obtain a helpful summary of traffic laws at the Department of Motor Vehicles in your area.

Will you help us to make our highways safer for yourself and others?

DEPARTMENT OF MOTOR VEHICLES

Appendix B-12

Epperson, W. V. and Harano, R. M. (1975). An evaluation of some additional factors influencing the effectiveness of warning letters. *Accident Analysis and Prevention* 7: 239-247.

(Low Threat / High Intimacy)

NOTICE

Your case has been given to me as part of my special caseload of violation repeaters. My review of your record indicates that you have been convicted on several occasions of violations of the traffic laws. Since you are very close to the legal definition of a negligent driver. I must make a recommendation to the Department as to what we should do about you.

I know from personal experience that many drivers with records like yours are a danger to themselves, their loved ones, and their community. I also urge you to consider the financial drain caused by traffic fines, insurance rate increases and accidents. Is it really worth it?

I am sure you must realize the important responsibility which the Department and I have to keep unsafe drivers off our highways. I am counting on you to show me that you can drive in a safe, responsible manner. I will personally check your record for improvement to determine if further action is necessary.

I have found that drivers like you can improve if they really try. But remember, the time for your improvement is now—not latter.

Sincerely yours,

DRIVER IMPROVEMENT ANALYST

Appendix B-13

Epperson, W. V. and Harano, R. M. (1975). An evaluation of some additional factors influencing the effectiveness of warning letters. *Accident Analysis and Prevention* 7: 239-247.

(Notice of Driver Improvement)

License No. _____

As of this date our records indicate that you have not been involved in traffic citations or accidents since receiving our notice several months ago. I am sincerely pleased to acknowledge your improvement and positive response. It is unfortunate that more drivers do not show a similar improvement. I hope that you will continue to drive safety and protect your driving privilege.

Sincerely,

DRIVER IMPROVEMENT ANALYST
Division of Drivers Licenses

Appendix B-14

Epperson, W. V. and Harano, R. M. (1975). An evaluation of some additional factors influencing the effectiveness of warning letters. *Accident Analysis and Prevention* 7: 239-247.

(Reinforcement Letter)

NOTICE OF DRIVER IMPROVEMENT

License No. _____

As of this date our records indicate that you have not been involved in traffic citations or accidents since receiving our notice several months ago. I am sincerely pleased to acknowledge your improvement and positive response. It is unfortunate that more drivers do not show a similar improvement. I will continue to review your record over the next six months for further evidence of progress. We hope that you will continue to drive safely and protect your driving privilege.

Sincerely,

DRIVER IMPROVEMENT ANALYST
Division of Drivers Licenses

Appendix B-15

Kaestner, N. & Speight, L. (1975). Successful alternatives to license suspension: The defensive driving course and the probationary license. *Journal of Safety Research* 7, 2.

(Last Chance Warning Letter)

Your driving record now has two major convictions within a five-year period of the type described in the Habitual Traffic Offender Act. A third major conviction in the five-year period will subject you to this law and could lead to a ten-year license revocation.

The law also requires that we offer you an opportunity for a meeting with a representative of the Motor Vehicles Division, in the county in which you reside. The purpose of this meeting is to advise you of the provisions of the law and of the availability of educational programs for driver improvement.

Briefly, this law (ORS 484.700 – 484.750) will require the Motor Vehicles Division to send a certified abstract of your operating record to the district attorney in your home county if you are convicted or forfeit bail on a third major traffic offense within a five-year period.

The district attorney is then required to file a complaint against any driver so certified, in the circuit court of the county in which the driver lives. If the court finds that the driver is a habitual offender, the court shall file with the Motor Vehicles Division a copy of the court order and the division must then revoke the driver's license for ten years.

If you wish to meet with a representative of this division, please complete the blanks below and return this entire letter to this division within ten days. You will be notified of the time and place to appear if you indicate you wish to have an advisory meeting.

Very truly yours,

John H. DeBow
Section Head, Driver Safety

Appendix B-16

Sherman, B. & Ratz, M. (1979). *An evaluation of probation-by-mail as an alternative to mandatory hearing attendance for negligent operators*. Sacramento: California Department of Motor Vehicles.

(Probation By Mail Letter)

**NOTICE/ORDER OF PROBATION,
GROUNDS THEREFORE, AND OF
OPPORTUNITY TO BE HEARD**

Your privilege to operate a motor vehicle upon the highways of this State will be placed on PROBATION on the effective date shown above.

THE GROUNDS FOR THIS ACTION IS: YOU ARE A NEGLIGENT OPERATOR OF A MOTOR VEHICLE.

The records of this Department show that because of traffic convictions you are presumed to be a negligent operator as defined in Section 12810 of the Vehicle Code. A COPY OF YOUR DRIVER RECORD IS ATTACHED.

You are hereby notified that because of such record, this Department will place your privilege to drive on probation as provided in Sections 12809, 13359, 14250 V. C.

AS A CONDITION OF PROBATION YOU SHALL OBEY THE PROVISIONS OF THE VEHICLE CODE OF CALIFORNIA AND ALL TRAFFIC REGULATIONS.

VIOLATION OR NON-COMPLIANCE of the terms and conditions of probation is cause for suspension or revocation of your driving privilege.

Prior to the above effective date you are entitled to request a hearing to show that the cause of the probation is not true. FAILURE TO MAKE A WRITTEN REQUEST FOR A HEARING IS A WAIVER OF YOUR RIGHT TO A HEARING PURSUANT TO SECTION 14103 OF THE VEHICLE CODE. Your written request for a hearing MUST BE POSTMARKED NO LATER THAN 14 DAYS FROM THE DATE OF THIS ORDER. On receipt of your written request for a hearing this order of probation will be stayed and an informal hearing will be scheduled unless a formal hearing is specifically requested. (See over for hearings). This means that the probation will not be imposed on the effective date shown on this order; rather you will be notified after the hearing of the Departments decision to reimpose or not reimpose the probation.

If no hearing is requested PROBATION WILL BE ENDED one year from the effective date of this order, if you have had no additional traffic convictions.

BE SURE TO READ THE INSTRUCTIONS ON THE REVERSE SIDE OF THIS NOTICE/ORDER

DEPARTMENT OF MOTOR VEHICLES

Appendix B-17

Sherman, B. & Ratz, M. (1979). *An evaluation of probation-by-mail as an alternative to mandatory hearing attendance for negligent operators*. Sacramento: California Department of Motor Vehicles.

(Individual Hearing Letter)

**NOTICE OF PROPOSED ACTION,
GROUNDS THEREFORE, AND OF
OPPORTUNITY TO BE HEARD.**

Driver's License _____
Field File _____

The records of this Department show that because of traffic convictions you may be a negligent operator.

You are hereby notified that because of such record, this Department proposes to suspend or revoke your driving privilege or to place your privilege on probation as provided in Sections 12809, 13359, 13950-52, V. C.

You are entitled to a hearing to present any evidence, oral or written, as to why the Department should not take the proposed action against your driver's license. You have the choice of a formal or informal hearing. In either type of hearing, you may present any evidence on your behalf. You are not required to be represented by legal counsel, but your attorney may be present if you wish. In the formal hearing a complete written record is made of the entire proceedings and is available for review of the courts.

An informal hearing has been scheduled by the Department of Motor Vehicles, to be held at:

A Driver Improvement Analyst will act as referee at the informal hearing.

A formal hearing, if requested, will be scheduled in place of the informal hearing.

You may respond to this notice either through appearance at the informal hearing or by demanding a formal hearing within 14 days from the date of this notice. Failure to respond to this notice is a waiver of the right to a hearing, and the Department may take action without hearing as authorized in Section 14103 V. V. Please bring to the hearing any Driver's License which has been issued to you.

Dated
Division of Driver's License

Appendix B-18

Marsh, W.C. (1986). *Negligent operator treatment evaluation system: Program effectiveness report no. 2* (Report No. 110). Sacramento: California Department of Motor Vehicles.

(Regular Warning Letter)

Drivers License No.

Did you know:

- CALIFORNIA HAS A NEGLIGENT DRIVER POINT SYSTEM.
- YOUR TRAFFIC CONVICTIONS AND ACCIDENTS ADD UP TO POINTS AGAINST YOUR DRIVING RECORD.
- THE MORE POINTS YOU GET THE MORE LIKELY YOU ARE TO BE INVOLVED IN A SERIOUS ACCIDENT.
- 6 POINTS IN 1 YEAR, 8 IN 2 YEARS, OR 10 IN 3 YEARS AND YOU STAND TO LOSE YOUR LICENSE.

Won't you take just a few moments to review your driving habits? You can make the highways safer for all of us. The time for improvement is now.

If there is a discrepancy in your driving record, you may contact the Sacramento Department of Motor Vehicles, Area Code (telephone number).

CONVICTIONS:

Appendix B-19

Marsh, W.C. (1986). *Negligent operator treatment evaluation system: Program effectiveness report no. 2* (Report No. 110). Sacramento: California Department of Motor Vehicles.

(Alcohol Warning Letter)

Drivers License No.

Did you know:

- DMV HAS A NEGLIGENT DRIVER PROGRAM.
- YOUR TRAFFIC CONVICTIONS AND ACCIDENTS ADD UP TO POINTS AGAINST YOUR DRIVING RECORD.
- THE MORE POINTS YOU GET THE MORE LIKELY YOU ARE TO BE INVOLVED IN A SERIOUS ACCIDENT.
- 6 POINTS IN 1 YEAR, 8 IN 2 YEARS, OR 10 IN 3 YEARS AND YOU STAND TO LOSE YOUR LICENSE.

You have just had a major traffic conviction. Major convictions count twice as much as other convictions because they are more likely to cause serious accidents and usually involve alcohol or drugs. For example, you have probably read that alcohol is the single leading cause of fatal accidents. But were you aware that more than half of all fatal accidents in California last year involved drinking drivers?

Won't you take just a few moments to review your driving habits? You can make the highways safer for all of us. The time for improvement is now.

If there is a discrepancy in your driving record, you may contact the Sacramento Department of Motor Vehicles, Area Code (telephone number).

CONVICTIONS:

ACCIDENTS:

Appendix B-20

Marsh, W.C. (1986). *Negligent operator treatment evaluation system: Program effectiveness report no. 2* (Report No. 110). Sacramento: California Department of Motor Vehicles.

(Regular Notice of Intent)

**FORMAL NOTICE
OF INTENT TO SUSPEND**

Drivers License No.

Your driving record shows you have been convicted of a major traffic violation. This is formal notice that the department intends to suspend your drivers license unless your record improves dramatically.

Because your record includes a major traffic conviction, you are facing a license suspension on two grounds. First, another major conviction could result in an automatic withdrawal of your license for a minimum of one year. This would be in addition to a very large fine and probable jail sentence. The second type of suspension you face is on negligent operator grounds. Section 128.10.5 (B) of the Vehicle Code defines a negligent operator as one who accumulates six points in one year, eight in two years, or ten in three years. When you consider that major violations count two points, we think you can appreciate how close you already are to this definition.

You may ask why we are proposing such harsh actions. The reason is quite simple. We are concerned for your safety. Numerous studies have shown most major traffic violations involve, to one degree or another, driving after drinking. Drunk driving and negligent driving are the two greatest causes of accidents. Drivers who meet the negligent operator point count definition and who also have convictions involving drinking and driving represent the highest accident risk group of any in the driving population.

Unless you can afford to lose your license, it is essential that you obey all traffic laws and avoid driving while impaired.

If there is a discrepancy in your driving record, you may contact the Sacramento Department of Motor Vehicles, Area Code (telephone number).

CONVICTIONS:

Appendix B-21

Marsh, W.C. (1986). *Negligent operator treatment evaluation system: Program effectiveness report no. 2* (Report No. 110). Sacramento: California Department of Motor Vehicles.

(Alcohol Notice of Intent)

FORMAL NOTICE OF INTENT TO SUSPEND

Drivers License No.

You are in danger of being legally classified as a negligent operator. This letter is a formal notice that the department intends to suspend your driving privilege unless your record improves dramatically.

What is a negligent operator? Negligent driving is determined by a point system. Major convictions, such as hit-and-run, reckless driving, or driving under the influence count two points. Any other traffic convictions involving the unsafe operation of a motor vehicle receive one point. An accident for which you are judged responsible counts one point. Vehicle Code section 128.10 (B) defines a negligent operator as one who has accumulated either six points in one year, eight points in two years, or ten points in three years.

Look at you record! Think about it! If you continue to drive as you have been, we intend to take away your drivers license for six months. Can you afford to have that happen?

If there is a discrepancy in your driving record, you may contact the Sacramento Department of Motor Vehicles, Area Code (telephone number).

CONVICTIONS:

ACCIDENTS:

Appendix B-22

Marsh, W.C. (1992). *Negligent operator treatment evaluation system: program effectiveness report # 6* (Detailed Findings). Sacramento: California Department of Motor Vehicles.

(Regular Warning Letter)

Drivers License No.

READING THIS LETTER MAY MEAN THE DIFFERENCE BETWEEN KEEPING OR LOSING YOUR DRIVER LICENSE.

- DRIVING IS A PRIVILEGE YOU KEEP BY DRIVING SAFELY.
- YOUR TRAFFIC CONVICTIONS AND ACCIDENTS ADD UP TO POINTS AGAINST YOUR RECORD.
- DMV WILL SUSPEND THE LICENSE OF DRIVERS THE LAW DEFINES AS NEGLIGENT.
- THE LAW DEFINES YOU AS NEGLIGENT IF YOU HAVE 4 POINTS IN ONE YEAR, 6 IN 2 YEARS, OR 8 IN 3 YEARS.
- Most traffic convictions and accidents count one point and major convictions, such as drunk driving, count two points. Convictions in a vehicle requiring the driver to have a commercial driver license or special driver certificate count more.
- Statistics show the more points you get, the more likely you are to be involved in a serious accident.

Your record, shown below, now adds up to 2 or 2 _ points. Only 3% of California drivers had such a record during the past year.

Now is the time to improve your driving habits. One important duty the Department of Motor Vehicles has is to make the highways safer for everyone. The Department is doing that now by encouraging you to improve your driving habits to avoid any more violations and accidents. If your record continues to the level defined as negligent, the Department will suspend your license. The choice is yours.

If there is a discrepancy in your driving record, you may contact the Sacramento Department of Motor Vehicles, Area Code (telephone number).

CONVICTIONS:

Appendix B-23

Marsh, W.C. (1992). *Negligent operator treatment evaluation system: program effectiveness report # 6* (Detailed Findings). Sacramento: California Department of Motor Vehicles.

(Alcohol Warning Letter)

Drivers License No.

READING THIS LETTER MAY MEAN THE DIFFERENCE BETWEEN KEEPING OR LOSING YOUR DRIVER LICENSE.

- DRIVING IS A PRIVILEGE YOU KEEP BY DRIVING SAFELY.
- YOUR TRAFFIC CONVICTIONS AND ACCIDENTS ADD UP TO POINTS AGAINST YOUR RECORD.
- DMV WILL SUSPEND THE LICENSE OF DRIVERS THE LAW DEFINES AS NEGLIGENT.
- THE LAW DEFINED YOU AS NEGLIGENT IF YOU HAVE 4 POINTS IN ONE YEAR, 6 IN 2 YEARS, OR 8 IN 3 YEARS.
- MOST TRAFFIC CONVICTIONS AND ACCIDENTS COUNT ONE POINT AND MAJOR CONVICTIONS, SUCH AS DRUNK DRIVING, COUNT TWO POINTS. CONVICTIONS IN A VEHICLE REQUIRING THE DRIVER TO HAVE A COMMERCIAL DRIVER LICENSE OR SPECIAL DRIVER CERTIFICATE COUNT MORE.

Statistics show the more points you get, the more likely you are to be involved in a serious accident.

You have recently been convicted of a major traffic violation. Please consider these facts if your violation involved the use of alcohol and/or drugs:

- DRIVING AFTER CONSUMING ALCOHOL/DRUGS IS THE LEADING CAUSE OF FATAL ACCIDENTS.
- MORE THAN HALF OF ALL FATAL ACCIDENTS IN CALIFORNIA LAST YEAR INVOLVED DRINKING DRIVERS.

Your record, shown below, now adds up to 2 or 2 _ points. Now is the time to improve your driving habits. One important duty the Department of Motor Vehicles has is to make the highways safer for everyone. The Department is doing that now by encouraging you to improve your driving habits to avoid any more violations and accidents. If your record continues to the level defined as negligent, the Department will suspend your license.

If there is a discrepancy in your driving record, you may contact the Sacramento Department of Motor Vehicles, Area Code (telephone number).

Any other order already taken in your name continues in full force and effect.

CONVICTIONS:

Appendix B-24

Marsh, W.C. (1992). *Negligent operator treatment evaluation system: program effectiveness report # 6* (Detailed Findings). Sacramento: California Department of Motor Vehicles.

(Regular Notice of Intent Letter)

Drivers License No.

It is the responsibility of the Department of Motor Vehicles to track traffic violations and accidents for all California Drivers and to suspend the driving privilege of drivers who are unsafe. This is done to ensure the safety of the motoring public.

Your current driving record has put you in danger of being legally classified as a Negligent Operator. This is a formal notice that the Department intends to suspend your driving privilege if you receive an additional traffic conviction or are found responsible for an accident.

A Negligent Operator is a driver who has accumulated either 4 points in 1 year, 6 points in 2 years, or 8 points in 3 years. By law, points are based on traffic convictions and accidents. For example, major traffic convictions such as drunk driving, reckless driving, and hit-and-run count as two points, while other traffic convictions count as one. Convictions in a vehicle needing a commercial license or special driver certificate may receive a higher point count. If we determine you are responsible for an accident, you will be assessed on point. This may be in addition to any traffic conviction for that accident.

We have printed your driving record below. Please take the time to review it. Remember, the safety of California's highways is everyone's responsibility.

If your driving record is incorrect or you have any questions, please call us at (telephone number).

CONVICTIONS:

Appendix B-25

Marsh, W.C. (1992). *Negligent operator treatment evaluation system: program effectiveness report # 6* (Detailed Findings). Sacramento: California Department of Motor Vehicles.

(Alcohol Notice of Intent Letter)

Drivers License No.

It is the responsibility of the Department of Motor Vehicles to track traffic violations and accidents for all California drivers and to suspend the driving privilege of drivers who are unsafe. This is done to ensure the safety of the motoring public.

Your current driving record has put you in danger of being legally classified as a Negligent Operator. This is a formal notice that the Department intends to suspend your driving privilege if you receive an additional traffic conviction or are found responsible for an accident.

A Negligent Operator is a driver who has accumulated either 4 points in 1 year, 6 points in 2 years, or 8 points in 3 years. By law, points are based on traffic convictions and accidents. For example, major traffic convictions such as drunk driving, reckless driving, and hit-and-run count as two points; while other traffic convictions count as one. Convictions in a vehicle needing a commercial license or special driver certificate may receive a higher point count. If we determine you are responsible for an accident, you will be assessed one point. This may be in addition to any traffic conviction for that accident.

We have printed your driving record below. Your record shows that you have been convicted of a major violation. In most instances major violations involve driving after drinking. Drivers who have convictions involving drinking and driving represent the highest accident risk group in the driving population. Almost 50% of all fatal accidents are caused by drunk drivers. Please take the time to review your driving record. Remember, the safety of California's highways is everyone's responsibility!

Any other order already taken in your name continues in full force and effect.

If your driving record is incorrect or you have any questions, please call us at (telephone number).

CONVICTIONS:

Appendix B-26

Marsh, W.C. & Healey, E. J. (1995). *Negligent operator treatment evaluation system: Program effectiveness report # 7* (Summary of Findings). Sacramento: California Department of Motor Vehicles.

(Regular Warning Letter)

URGENT NOTICE

Drivers License No.

Dear California Driver,

Please take just a moment to review this notice. It may save your driver license.

You may not be aware that California law defines some drivers as "NEGLIGENT". Traffic convictions and responsible accidents add up to points on your driving record. Get 4 points in 12 months, 6 in 24 months or 8 in 36 months and you stand to lose your license because you are more likely to be involved in an accident.

We are concerned with your driving record and want to assist you to avoid being classified as a negligent driver.

Your record, with points, appears below. Fewer than 3 out of 100 California drivers built up such a record during the past year.

Won't you take just a few moments to review your driving habits? You can make the highway safer for all of us ... and retain your driver license in the process.

CONVICTIONS:

This action is independent of any other action taken by the court or this Department.

Department of Motor Vehicles
Division of Driver Safety

Appendix B-27

Marsh, W.C. & Healey, E. J. (1995). *Negligent operator treatment evaluation system: program effectiveness report # 7* (Summary of Findings). Sacramento: California Department of Motor Vehicles.

(Alcohol Warning Letter)

Drivers License No.

Dear California Driver,

Please take just a moment to review this notice. It may save your driver license.

You may not be aware that California law defines some drivers as "NEGLIGENT". Traffic convictions and responsible accidents add up to points on your driving record. Get 4 points in 12 months and you are likely to lose your driver license.

Major traffic convictions such as reckless driving and drunk driving count 2 points. Your driving record, which appears below, shows that you have been convicted of a major violation. If your conviction involved alcohol, consider that alcohol is the leading cause of fatal accidents and more than half of all fatal accidents in California last year involved drinking drivers.

Won't you take just a few moments to review your driving habits? You can make the highway safer for all of us ... and retain your driver license in the process.

CONVICTIONS:

This action is independent of any other action taken by the court or this Department.

Department of Motor Vehicles
Division of Driver Safety

Appendix B-28

Marsh, W.C. & Healey, E. J. (1995). *Negligent operator treatment evaluation system: program effectiveness report # 7* (Summary of Findings). Sacramento: California Department of Motor Vehicles.

(Regular Notice of Intent)

Drivers License No.

Dear California Driver,

Please take just a moment to review this notice. It may save your driver license.

You may not be aware that California law defines some drivers as "NEGLIGENT". Traffic convictions and responsible accidents add up to points on your driving record. Get 4 points in 12 months, 6 in 24 months or 8 in 36 months and you stand to lose your license because you are more likely to be involved in an accident.

We are concerned with your driving record and want to assist you to avoid being classified as a negligent driver.

Your record, with points, appears below. Fewer than 2 out of 100 California drivers built up such a record during the past year.

Won't you take just a few moments to review your driving habits? You can make the highway safer for all of us ... and retain your driver license in the process.

CONVICTIONS:

This action is independent of any other action taken by the court or this Department.

Department of Motor Vehicles
Division of Driver Safety

Appendix B-29

Marsh, W.C. & Healey, E. J. (1995). *Negligent operator treatment evaluation system: program effectiveness report # 7* (Summary of Findings). Sacramento: California Department of Motor Vehicles.

(Alcohol Notice of Intent)

URGENT NOTICE

Drivers License No.

Dear California Driver,

Please take just a moment to review this notice. It may save your drivers license.

You may not be aware that California law defines some drivers as "NEGLIGENT". Traffic convictions and responsible accidents add up to points on your driving record.

We are concerned with your driving record and want to assist you to avoid being classified as a negligent driver. Major traffic convictions such as reckless driving and drunk driving count 2 points. Your Driving record, which appears below, shows that you have been convicted of a major violation. Get 4 points in 12 months and you are likely to lose you driver license.

If your conviction involved alcohol, consider that alcohol is the leading cause of fatal accidents and more than half of all fatal accidents in California last year involved drinking drivers.

Won't you take just a few moments to review your driving habits? You can make the highway safer for all of us ... and retain your driver license in the process.

CONVICTIONS:

This action is independent of any other action taken by the court or this Department.

Department of Motor Vehicles
Division of Driver Safety

Appendix B-30

Jones, Bernie (1997). Age differences in response to high and low-threat driver improvement warning letters. *Journal of Safety Research* 28, 1: 15 – 28.

(Standard Warning Letter)

Recently, I reminded you of your obligations as a driver. The following traffic violations and/or preventable accidents were posted to your record after the first letter.

Accident/Violation	Accident/Citation Date	Conviction Date
@	@	@
@	@	@
@	@	@

This letter may not apply to you if you have corrected your driving problems. However, you may need to be aware that the Motor Vehicles Division will take the necessary steps to help you be a better driver for the benefit of all Oregon drivers.

If you have additional traffic tickets or preventable accidents within 12 months of this letter, you may be required to attend a Driver Improvement Interview. You will be given the opportunity to discuss your driving record with a Driver Improvement Counselor. I hope this or any other action will not be necessary.

The enclosed pamphlet gives you more information about Oregon's Driver Improvement Program. I hope you will take time to read it since you are now involved in this program.

Appendix B-31

Jones, Barnie (1997). Age differences in response to high and low-threat driver improvement warning letters. *Journal of Safety Research* 28, 1: 15 – 28.

(Soft-Sell Warning Letter)

You were told about Oregon's Driver Improvement Program in an earlier letter. Your record shows that you have had two traffic tickets in 12 months. We are warning you that you may lose your privilege to drive in Oregon if you do not take steps NOW to improve your driving. A personal interview with a counselor is the next step in the program.

You can avoid the need for this interview if you drive trouble-free in the next 12 months. To help you do this, we strongly urge you to attend a driver improvement course.

These classes improve driver knowledge of traffic laws and safe driving practices. If you take one of these courses, it could be a very positive step toward improving your driving and will help you avoid future tickets and accidents.

Either class will help you become a safer and more responsible driver. Because we are more concerned than ever about your driving, we ask you to seriously consider taking one of these courses as soon as possible. Enrollment information is at the bottom of this page.

We have enclosed a pamphlet about how our Driver Improvement Program works. Please read it. We believe it offers good information and advice.